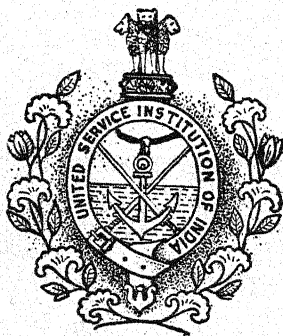


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PRINCIPAL CONTENTS

| | |
|--|---------------------------------------|
| Military Problems at High Altitude | ... <i>Lieut.-General B. M. Kaul</i> |
| The Peoples Liberation Army of China | ... <i>Brigadier H. S. Yadav</i> |
| Dilemma of the Technical Staff Officer | ... <i>Major Tarlochan Singh</i> |
| Fighting the Guerrilla | ... <i>Major R. D. Palsokar, M.C.</i> |
| Limited War and Air Power | ... <i>Sqn. Ldr. E. R. Fernandes</i> |
| Soldier Scientists | ... <i>Major Harbans Lal</i> |
| Scientific Expeditions Around the World 1760-1850 | ... <i>A. Beriot</i> |
| Three Mountains and Another | ... <i>Hari Dang</i> |

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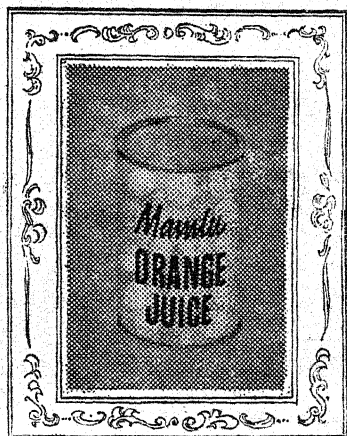
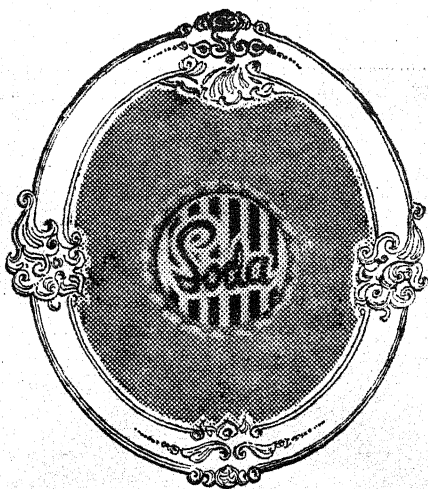
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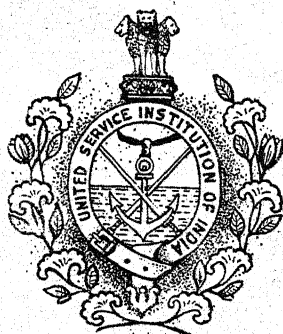
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hamare bhai ko le jao



It happened some years ago in the steel melting shops at the Jamshedpur works. A large ladle, carrying 75 tons of molten iron, suddenly crashed to the ground with a deafening noise from an overhead crane. The spattering sparks and red-hot metal seriously injured a number of brick-layers working at what seemed to be a safe distance. The air was rent with the frenzied shouts of the men and the hissing of steam.

The first ambulance could remove only five of the injured to the hospital. General Manager Keenan could take only three more in his car. He chose the three who had a better chance of survival than the rest. One of these men, a Hindu worker, however, refused to go. "Do not take me away", he said. Disregarding his own agony, he feebly nodded towards a half-burnt Muslim colleague, and said: "*Hamare bhai ko le jao.*" As Keenan recalls, "The Hindu who was in pain and danger of death remembered, not that the Mohammedan was of a different faith, but that he was his brother."

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CONTENTS

OCTOBER-DECEMBER, 1961

| | | |
|--|-------------------------------|-----|
| Military Problems at High Altitude | Lieut.-General B. M. Kaul ... | 251 |
| The Peoples Liberation Army of China | Brigadier H. S. Yadav ... | 254 |
| Dilemma of the Technical Staff Officer | Major Tarlochan Singh ... | 264 |
| Fighting the Guerrilla | Major R. D. Palsokar, M.C. | 268 |
| Limited War and Air Power | Sqr. Ldr. E. R. Fernandes ... | 273 |
| Soldier Scientists | Major Harbans Lal ... | 282 |
| The International Scene | Mahendra Kumar ... | 298 |
| Scientific Expeditions Around the World 1760-1850 | A. Beriot ... | 295 |
| Three Mountains and Another | Hari Dang ... | 302 |
| Book Reviews | ... | 308 |
| <p>John XXIII: Pope of the Council (S. Aradi), Portrait of an Officer (Pierre Henri Simon), Memoirs of a Public Servant (Lord Salter), I Captained the Big Ships (Commodore Robert G. Thelwell O.B.E., R.D., R.N.R., Retd.), Nelson's Letters (Geoffrey Rawson), Lure of Everest (Brigadier Gyan Singh), The New English Bible—New Testament, Decision, Order and Time in Human Affairs (G. L. S. Shackle), Working With Groups (Josephine Klien), Rebels In Paradise (James Mossman), Book of Rifles: An Encyclopædic Reference (W. H. B. Smith), The Book of Pistols & Revolvers: An Encyclopædic Reference Work (W. H. B. Smith), Our Times—1900-1961 (Stephen King-Hall), The Peace Makers (Marquis Child), American Foreign Policy: Theory and Reality (Louis J. Halle), The Anglo-American Predicament (H. C. Allen), Russia Forty Years On (M. Philips Price), The Awakening Sahara (Nicolas Bodington), Oldest Aiy: A Portrait of Salazar's Portugal (Peter Frayer & Patricia Mc Gowan Pinheiro).</p> | | |
| Correspondence | ... | 328 |
| Secretary's Notes | ... | 330 |
| Additions to Library | ... | 331 |

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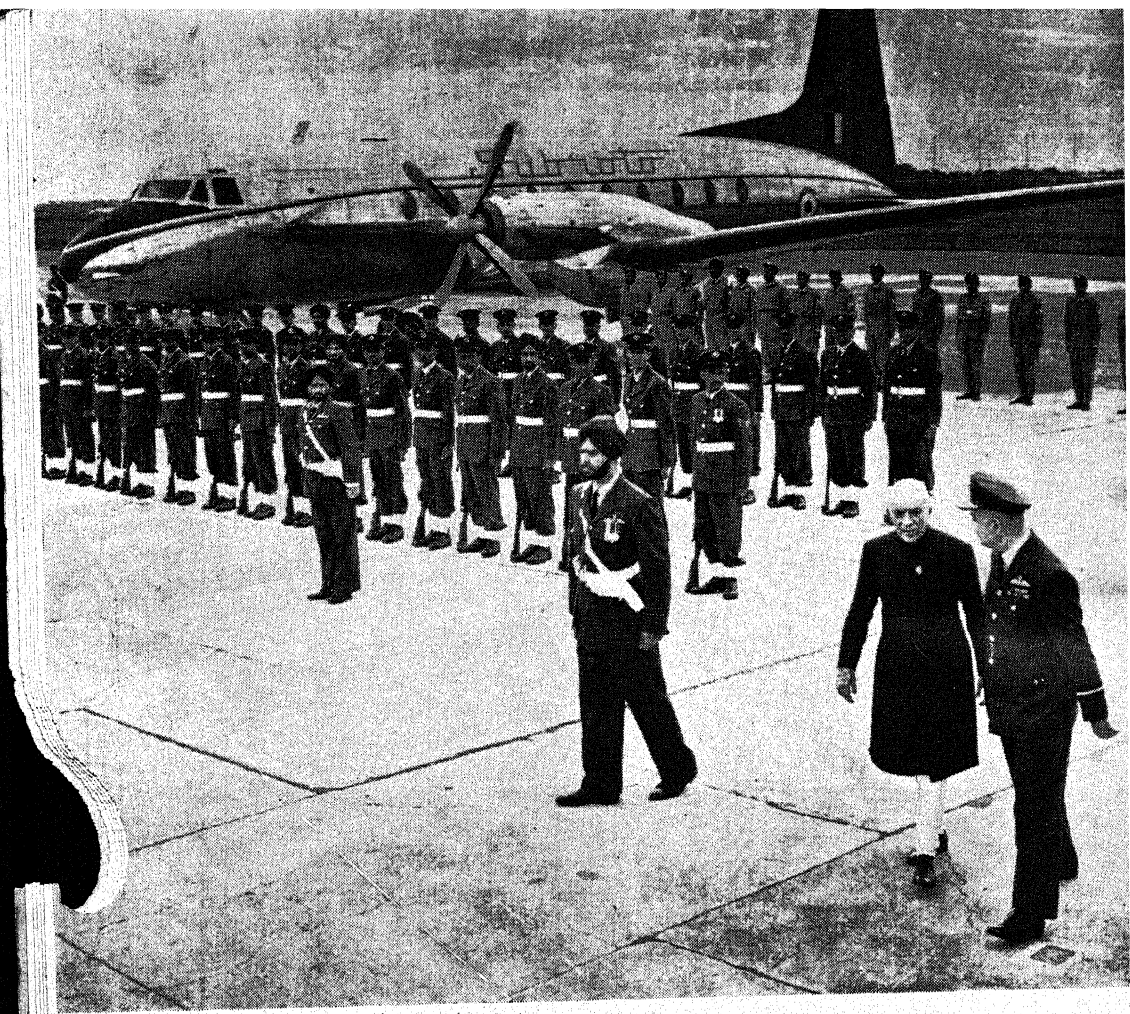
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Prime Minister Jawaharlal Nehru inspecting the Kanpur-built AVRO-748 'Subroto'

The Journal of the United Service Institution of India

VOL. LXXXI

OCTOBER-DECEMBER, 1961

No. 385

EDITORIAL

NEW FRONTIERS IN DEFENCE

THE acquisition of the first aircraft-carrier INS Vikrant by the Indian Navy and the manufacture of the first Indian production model of AVRO-748, the Subroto, by the Aircraft Manufacturing Depot at Kanpur mark a new frontier in national defence. By virtue of her geographical position and a coastline extending over 3,500 miles, India is as much a sea as a land Power, and its interests, both economic and strategic, in the Indian Ocean, in particular, are, therefore, far-flung. The role of INS Vikrant will thus be to serve as a vital instrument for protecting India's overseas' interests and adding to its sphere of security. Capable of carrying out various functions with the modern jet aircraft, the aircraft-carrier forms the backbone of a naval task force and has a special place in the coastal defence system of the peninsula.

In support of aircraft-carriers, it is necessary to establish the appropriate backing on land in the form of air stations, training schools and air-base depots to meet the growing needs of a country on the threshold of a major industrial revolution. The successful completion of the first production model of the AVRO-748 was signalled by the public flight inaugurated by the Prime Minister which conferred on the IAF the distinction of being the only Air Force manufacturing the aircraft it uses. As one of the important facets of our foreign policy is opposition to military blocs, it makes it imperative for the country to be self-reliant in the matter of defence production and it is obvious, therefore, that India cannot depend continuously on foreign imports in this regard.

As a major step towards self-sufficiency in the matter of transport aircraft, the AVRO project to replace the existing fleet of

Dakotas was proposed in 1959 and an agreement with Hawker-Siddeley Aviation, Limited, was entered into the same year. The project was formally inaugurated by the late Air Marshal S. Mukerjee early next year and since then Indian technicians have been working round the clock to complete the aircraft in record time. The jigs, tools and rigs required for the manufacture of the aircraft were locally made out of resources available at the various defence establishments and material and equipment salvaged from disposals. By undertaking indigenous manufacture of these items, the Kanpur Depot has not only saved time but, what is more, also the much-needed foreign exchange. It is interesting to note that as many as 5,000 modifications have been incorporated in the Indian-built AVRO since the conception of the first design and subsequent trials and test flights of the proto-type built in Britain.

The first AVRO-748 produced by the Kanpur Depot has been aptly christened "the Subroto" in memory of the late Air Marshal Mukerjee. And many more aircraft undoubtedly will come out of the depot's production lines soon at the rate of three to four a month. Not only will they meet the civilian and military requirements but they envisage a big export potential. Combining the industrial traditions of Kanpur and its technical manpower and material resources with the Air Force tradition of discipline, loyalty and high sense of duty and enterprise, the Aircraft Manufacturing Depot may well be expected soon to arrive at a synthesis of its own motto of "Salvation Lies in Self-Sufficiency" and that of the Air Force of "Touch the Sky With Glory."

MILITARY PROBLEMS AT HIGH ALTITUDE

By Lieut-General B. M. KAUL

TO men like Tenzing Norgay, after conquering Mount Everest, high altitude means nothing less than 20,000 feet. But the concept of what is high altitude has kept changing so far as we in the Indian Army are concerned during the last fifteen years. In 1948, when we operated in Kashmir at 11,000 feet or so, it was considered a tough assignment. Today, compelled by circumstances, not of our own making, we are defending our borders at heights of up to 19,000 feet. During the course of our experience at these heights, we have come across many difficult problems which need to be solved. Let us see what they are.

First of all, mere existence at high altitude is a problem. It is not easy to lead a normal life at 16,000—and less so at 18,000 feet without periodic doses of oxygen. You suffer from breathlessness, feel giddy, have headaches and nausea, apart from loss of hunger, sleep and inability to exert much generally. Carrying your own weapons and equipment becomes a burden. What is taken in your stride at lower levels, becomes a struggle at these heights. Time acclimatises you but only up to a point. You feel homesick, lonely and bored as you are engulfed in complete wilderness and are living in comparative discomfort. You do not get your mail from home regularly because of irregular airdrops due, in turn, to inclement weather. If you have a radio, its programmes do not amuse you, like they do lower down. You cannot play games except indoors. Outdoor games are either too strenuous or cannot be played due to freezing temperatures. You seldom enjoy what you do except during patches of moderate weather which are few and far between.

Due to exigencies of the service, you have to go out on patrols in biting wind and in the face of blizzards, snow and sleet, often walking over frozen rivers and negotiating precipitous climbs. In this process, you at times get pneumonia, frost bitten and snow blind, and even strain your heart, if you are not careful. In other words, you are constantly going through abnormal physical stress and strain. During many treks at heights of over 16,000 feet, I found, in the last year or two, that despite physical fitness, one's pulse rate shot up from 75 at sea level to over 100 at these altitudes and one's heart kept pounding at a much greater tempo. All this indicates excessive strain. The longer its duration, the greater are its ravages.

If you slip in this dangerous terrain over cliffs, you are liable to dislocate or fracture your bones. Wounds heal slowly at these heights and medical attention is not available at every stage. A doctor and medicine take time to reach. In a cantonment at sea level, if the hospital is ten miles away, the doctor can reach you or you can reach the doctor within minutes. If a casualty takes place due to serious injury or double-pneumonia at 17,000 feet and the doctor is located fifty miles away, which may well be, it will perhaps take a week for him to reach the casualty as he has to walk the distance through heavy snow, provided he survives the walk himself in conditions of arctic severity. By this time, the patient may be dead. Of course, the doctor can be flown by a helicopter. But it may or may not be available due to un-serviceability at any given time or due to general shortage of helicopters. Also, there is the chance of the casualty being located in a place which is inaccessible even by a helicopter. Moreover, the doctor is not a machine. He can, at times, himself feel sick, giddy, need oxygen and medical aid. The ques-

tion is how to evacuate a casualty speedily in order to save the patient's life or render timely medical aid to prevent complications.

There are many other problems. You do not sleep in a proper bed. It is, at best, an improvised affair. More often than not you sleep on the floor. You seldom feel warm in bed. If some contrivances are hatched up to warm up the tent or the bunker in which you live, you are liable to exposure due to the wide variation between the temperature within and outside. It takes some courage to have a bath and go to the latrine at these altitudes, situated away from your "abode", specially during snowfall or blizzards. Water is scarce and is available in lakes or springs which may be a long way off and remain frozen for the better part of the year. Cooking becomes a complicated matter. First, snow has to be melted into water which has to be boiled. This process takes long and consumes considerable oil. Even when the water does boil its capacity to cook meat, vegetables, rice and other items of rations is below par and as a result, these articles remain half cooked. If you go without fresh milk, vegetables and fruits for prolonged periods, the result is malnutrition.

Distances appear deceptive. A place which seems at a stone's throw turns out to be much farther away. Your imagination runs riot at times. Tempers get frayed easily. Your behaviour becomes unpredictable. You are liable to become irritable and tend to live on the edge of your nerves. There are, of course, abnormal men on whom height has no effect. But such cases are few and far between.

Performance of all internal combustion engines deteriorates at these heights and due to severity of weather, oil and water in the vehicles get frozen.

Construction of living accommodation at high altitudes also becomes a complex affair. What type of shelter should it be? Of normal height, partially underground or totally below the earth's surface? There are many pros and cons in each case. The main question is how to position stores at the requisite site. This is only possible by air which is already strained to breaking point through other responsibilities.

Once the shelters are built, there is the danger of their being swept away by avalanches. So the need of their being suitably sited is to be remembered.

The reception of the conventional wireless sets is affected by low temperatures and the wind chill reduces the efficiency of their components. Laying of teleprinting lines and their maintenance are difficult tasks at the best of times.

There are certain conflicting priorities in these areas. Induction of troops along with their weapons and equipment and their maintenance is of the first importance. Construction and repair of airfields is no less important because if aircraft cannot land, or get damaged in the process of landing, it will have obvious repercussions. At the same time it is essential to build roads, so that the strain on the Air Force involved in supply dropping and transportation of men and material can be relieved. But roads cannot be built above, say, 16,000 feet, except in certain areas, as at such heights they remain under snow for the better part of the year. It is, therefore, not a sound proposition to waste time, money and effort on roads above certain heights, where troops must depend on maintenance only by air.

Air drops have their own difficulties. Sometimes, the parachute fails to open up and hence rations, ammunition, stores or medicines being dropped

come down as dead weight and are damaged or destroyed. On the other hand, due to the velocity of wind, the article being dropped may land in inaccessible areas from where it cannot be retrieved or land far away from the dropping zone which takes considerable further effort to get it up to the required area.

Construction of airfields or roads at these heights is a Herculean task. Water remains frozen for nearly eight months in the year. Little work is possible during the remaining four months. Considerable tonnage of stores and machinery is required for construction purposes which have to be flown in. But the number of days on which flying is possible each month are far too few. With the slightest deterioration in weather and in view of the most hazardous flying conditions, you cannot take chances in this matter. Moreover, the transportation of engineer stores and machinery invariably clashes with the carriage of rations and stores for the maintenance of existing garrisons and induction of troops for the purpose of defence. If additional aircraft are purchased to meet these requirements, more pilots must be trained, more maintenance facilities must be provided (by milking existing resources of instructors and technicians) and until indigenous production is geared up, more foreign exchange must be found. All this is easier said than done.

To sum up, climbing a high mountain is difficult enough but to operate militarily at high altitudes under adverse conditions is far from easy. An expedition of mountaineers sets out to conquer a peak and returns to base after its conquest. It consists of well trained mountaineers and is equipped elaborately. Its participants undertake this venture for a few weeks for adventure, renown and recognition. The soldier, on the other hand often goes to high altitudes without adequate experience, with modest equipment and clothing, separated from his family, under continuous physical stress over prolonged periods and remains unrecognised in the process. For him it is a grim assignment. But under good leadership and in keeping with his traditions, he goes through it all without fuss, defending his country's frontiers at these heights with courage and determination.

THE PEOPLES LIBERATION ARMY OF CHINA

By Brigadier H. S. YADAV

INTRODUCTION

THE Chinese Peoples Liberation Army (PLA) is not an old army in the same sense as ours; but it is an army which has almost continuously been in action, from the day of its inception, for over 30 years. It is gigantic, of three or four million men; perhaps more; but no one outside China knows for certain how big it is. Day by day it grows in strength.

Throughout history, China and India have had the closest links of friendship. We have been deeply impressed with each other's culture, by philosophy and religion. The Himalayas have stood between us and nothing but the intangibles, the flights of fancy, could permeate the sacred air of these mountains to reach the other. We were safe, I suppose, for the simple reason that China could not stretch her arms through so formidable a barrier as the Himalayas. Also, there was no need to do so—expansion was possible to the vast spaces to the North and the West of China. This is no longer possible—at least not just yet. The necessity for crossing the Himalayas has made itself felt to meet the age-old tendency of China to carry on with its restless expansion.

The form and shape and ability of so large a mass as the PLA cannot conceivably be the subject of a single, rather short, article. It is a vast study. Nevertheless, this article is a beginning to that end, and the reader will have to seek other sources to satisfy his curiosity.

HISTORICAL BACKGROUND

At the beginning of the century, the Chinese people, oppressed economically and politically, were weary of the Manchu Emperor and of the foreign ingress into their country. The stage was set for a revolution. In October, 1911, there was a revolt in Hankow followed by revolts in fifteen provinces by December. The Emperor was forced to abdicate, and the Chinese Republic was proclaimed in January, 1912. Dr. Sun Yat Sen was the President for a few days, but he resigned in favour of Yuan Shih-K'ai, an ambitious and egotistic man, who betrayed the Republic. He died in 1916.

Yuan Shih-K'ai's death was followed by a decade of confusion and turbulence—and encroachment by Japan. Bandit leaders took law into their own hands, enlisted their own armies and ravaged the people. It was now that Dr. Sun Yat Sen, the founder of the Republic, saved the Chinese nation from total anarchy. He reorganised the Kuomintang, or the Nationalists, and with Russian help and under the generalship of Chiang Kai-Shek, the Chinese Nationalist Army achieved some measure of law and order over the disintegrating China. Till then the infant Communist Party was tolerated by the Nationalists and was allowed to exist with the assurance of consonant aims. But the aggrieved and desperate Chinese people saw an illusion of prosperity in the Communist tenets. By July, 1921, the Communist Party was strong enough to hold its first session, secretly, in Shanghai. It had now its own aims. Although, formally, the party still

adhered to the Nationalist programme, it insisted on organising the workers in Shanghai separately and in its own interest. This was a sinister act, which challenged the superiority of the Nationalist movement in China. So, in April, 1927, the Nationalist Army, under Chiang Kai-Shek, turned upon the Communist workers in Shanghai. Thus started the Civil War in China, which continues till today. "It has been an intensely personal kind of war, like a family feud, punctuated by reconciliation and recurrent outrages—with an undercurrent of persistent bitterness. The Kuomintang and the Communists (have) hated each other as only intimates can."*

Although Japan had been making encroachments in China for some years, the Peking Incident in 1937 precipitated a full-scale, but undeclared, war between the two countries. The Japanese forces pushed the Nationalist Armies to the West into the remote mountain province of Szechwan. From here the Nationalists continued the war. The Communist-led armies also opposed the Japanese. For 8 years, till Japan was defeated by the Allied Forces, both the Nationalists and the Communists fought the Japanese, but without compromising their own programme for China.

When the undeclared war against the Japanese ended in 1945, China was in shambles. The Nationalists moved into the coastal areas and Manchuria. The Communists were, however, better placed and, with Russian help, organised a formidable army. Although the USA tried hard to bring the Nationalists and the Communists together, all attempts at reconciliation failed. The rivals were determined to fight each other to the last.

The Nationalists suffered one disaster after another. Weakened by the Japanese invasion, which was prompted by antagonism towards Communism and fear of Russia, the Nationalists tumbled and fell by the middle of 1950, ironically, to Communism. The remnants of the Nationalist Army, under Chiang Kai-Shek, fled to the island stronghold of Formosa. Here they have been saved from annihilation by the US Fleet.

The people of China wanted a Communist regime—and they have it. Since coming into power, the Communists have achieved, in many spheres, what the Nationalists had failed to do. There have been many land reforms; notable progress has been made in industrialisation and education; health schemes have been introduced; communications have been improved; a great drive has been carried out to eradicate corruption; and, above all, the Chinese nation has been united and infused with a relentless urge to march on to bigger goals.

But it is a totalitarian regime, and it is ruthless in the implementation of reforms. Whereas it has much to show in the way of material progress, the freedom and dignity of man, as we know it, has been flouted. Man is being turned into an automaton to serve the irresistible will of those in power. Freedom of expression is non-existent. Ceaseless effort is made to indoctrinate men, especially soldiers, with the virtues of the new regime. And these soldiers have been sent to fight in Korea in 1950, and to occupy Tibet in 1953 and 1957. It is possible, from these campaigns, to assess the measure of the strength and weakness of the Chinese war-machine.

ORGANISATION AND EQUIPMENT

The People's Revolutionary Military Council is the equivalent of the Ministry of Defence in India. Directly under it is the General Headquarters of the

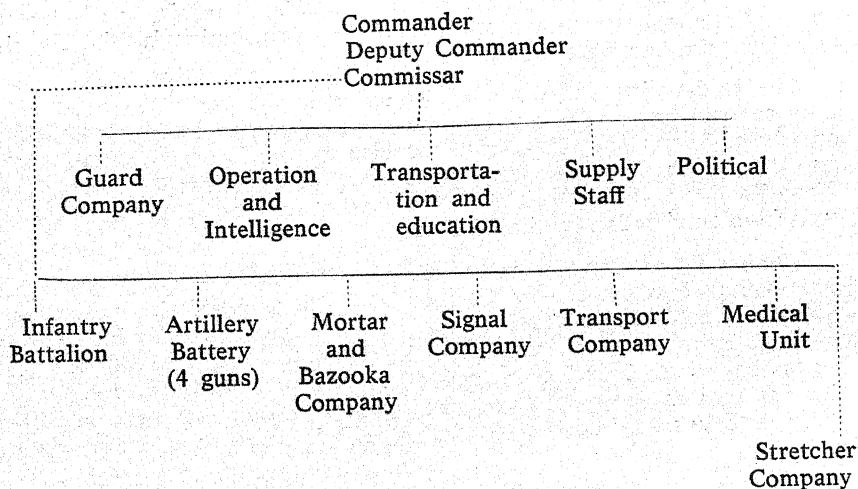
*China's Red Leaders by Robert S. Elegant.

PLA. The PLA is organised into field armies, the equivalent of Commands in India. Each field army controls two or more group armies, which in turn are subdivided into armies. Each army has two or three divisions. There are over 200 divisions. The organisation of the division is triangular, i.e., three regiments each.

In addition to the field armies, there are several modernised guerilla columns. The strength of these columns varies and may be anything up to 15,000. They are commanded by diehards, who have valuable fighting experience. The main task of these columns appears to be to strike at unexpected vulnerable points in the communication zone, collect information and generally assist the field armies.

The Chinese Communist Army has, in the recent past, undergone several changes. Not all formations have, however, been affected by these changes. The general pattern of organisation is based on the Soviet standard organisation. A division, therefore, may have as many as 10,000 men, or as few as 5,000. Each of the regiments may have a maximum of 3,000 odd officers and men and an infantry battalion approximately 800. The detailed organisation of a regiment is as follows:

REGIMENTAL HEADQUARTERS



The Communists make extensive use of civilians for supply, for work in communication zones and in stretcher companies. There is an element of engineers in the Signal Company. Apparently the Chinese Army does not believe in AIA's and CEME's Annual Inspection — a gratifying feature perhaps!

As regards Chinese armour there is a general shortage of serviceable tanks. Equally, artillery is not adequate, nor standard in equipment: the field-pieces are a hopeless assortment of American, Japanese and Soviet guns, and generally short of shells. With Soviet help, this position is, however, daily improving and will be better when indigenous production is in full swing.

The position in regard to small-arms seems equally poor. The bulk of the rifles and automatics are of Civil War vintage, and of various calibres. Main-

tenance is poor and ammunition is in short supply. The Communist soldier has been known to be a bad shot in the Korean War.

Those who have known and seen the Communist Chinese soldier say that he is badly equipped and clothed. He rarely wears socks and his shoes, or boots, are flimsy and require frequent replacement—and the system of replacement is poor. The Army depends largely on what it can capture or obtain locally. This weakness will, no doubt, be aggravated in sparsely populated areas, especially in mountainous terrain.

The Communist Army is better fed than before; but the food is simple and consists mostly of bread or rice and vegetables. It is not a balanced diet, but the Chinese soldier seems to thrive on it even though the bill of fare has very little variety. Again, the system of supply is primitive, and hungry or starving Chinese soldiers were captured more than once during the Korean War.

The men of the Chinese Communist Army have much the same background as Indian Jawans and are as diverse. They are used to a hard life and simple living. Their recruitment is on the "volunteer" basis. In fact, the "volunteers" are those on whom social pressure has been brought to bear in a very clever and insidious manner; or those whose families have been given land in return for recruitment. Quite a few have been inveigled into the ranks. There are still many who were enlisted during the civil war, or changed sides from the Kuomintang Army or the Japanese Puppet Army. The main criteria for recruitment, however, is that a man must have Communist Party leanings.

A very large number of NCOs and men have seen war—a formidable fact. On the other hand, there are few technicians—so badly needed for a modern force. A great drive is now going on to recruit students and ex-Nationalist personnel, who have a technical background. The Soviets, too, are helping in imparting technical training.

The political indoctrination is regular and relentless: the soldier's mind is kept occupied by ceaseless effort and ingenious devices; the achievements of heroes are exaggerated to give a psychological impetus to the others; commissars and partymen continually spy on the men for anti-party thoughts; public confessions and self criticism are encouraged; useful slogans are fed to the men; the men's minds are bent to serve only one ideal, one goal—Communism of the Chinese fashion. Those who disagree are destroyed.

The leaders of the Communist Army have a unique background—their commands have grown up around them. Many of the top-ranking officers have been in command of their formations for 20 to 30 years, most of which have been fighting. Yet, many of them lack formal education and only few have been to military schools of instructions. Among the junior ranks, a very large number have been commissioned from the ranks and have impressive battle records.

The Chinese, on the other hand, score in actual combat experience—certainly an asset, but not always a boon. Except in Korea, their combat experience has been gained in a civil war and against the Japanese.

Another feature of the Chinese Army is the vast hordes of guerrilla forces. Although there is today a very influential school of thought, which frowns at the organisation and use of guerrillas, the history of war proves conclusively that well-trained guerrillas are indisputably an asset on the battlefield.

The weapons are the weakest link in the Chinese strength.

TACTICAL CONCEPTS

Fire and movement is the basis of all tactics—it is a fundamental rule. There must be a fine balance between the two, and each must develop abreast of the other—not so in the Chinese Army. Whereas the Chinese have developed movement on foot to a fine art, fire-power has lagged behind. The men are hardy; they can move long distances, 20 to 30 miles or more, and still be fit to fight; but they are dependent on assorted rifles and light mortars for fire-power—and both weapons lack ammunition.

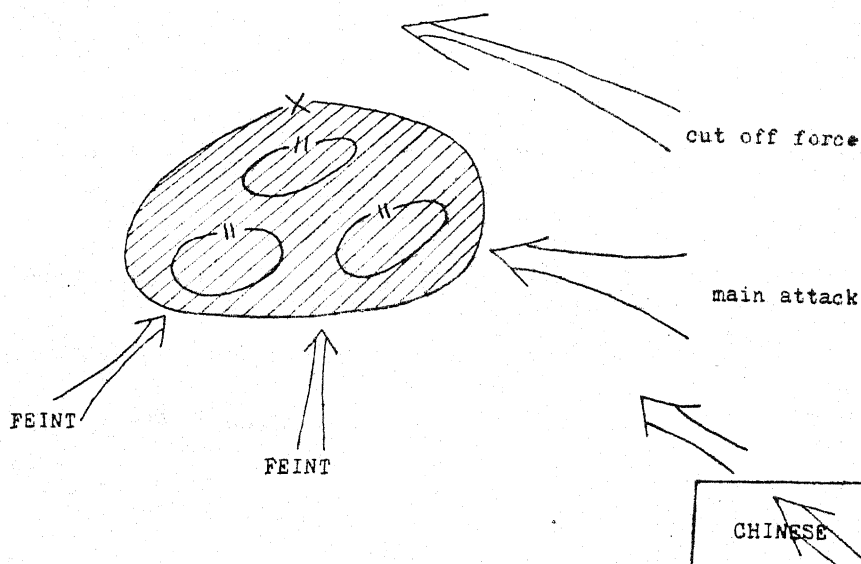
An attempt is made to overcome this weakness in fire-power by ruses—infiltration, guerilla action and by mass about which we hear so much. And, of course, they seek to escape superior fire-power by skilful camouflage and rapid dispersion. Here are some of the ways in which the Chinese may use their forces:

- (a) Guerillas or infantry parties seek to ambush small detachments, commanders on reconnaissance, supply and reinforcement columns, or rear installations. Guerillas have been known to infiltrate into rear areas as refugees, and then suddenly to turn upon their unsuspecting adversaries with devastating results.
- (b) The weak points are sought out with monotonous regularity and attacked by overwhelming numbers; or a great mass is concentrated on the flanks and the front, and then transferred swiftly to other areas. There is an obsession for numerical superiority at a decisive point; but invariably the Chinese seek gains to justify losses and avoid a battle of attrition. Relentless repetitive attacks are launched without respite or fear of sacrifice, if victory is in sight.
- (c) No attempt is made to hold an area or ground, but to destroy the enemy's forces by every possible stratagem. Where possible, the enemy is attacked while on the move.
- (d) The enemy is encircled from all sides in the same fashion as the Japanese used to do in the jungle.
- (e) Every engagement is thoroughly prepared for victory—a tremendous morale raising factor. If victory is not assured, an engagement is called off.
- (f) Attacks, and especially raids, are designed to capture enemy food and equipment.

Combat experience has made the Chinese versatile in the application of their tactical doctrines, but within the narrow orbit of their prescribed dictums. One can expect them always to do one of half a dozen things with certainty. It should not, therefore, be difficult or surprising to foresee the pattern of their moves. A few examples are given below diagrammatically:

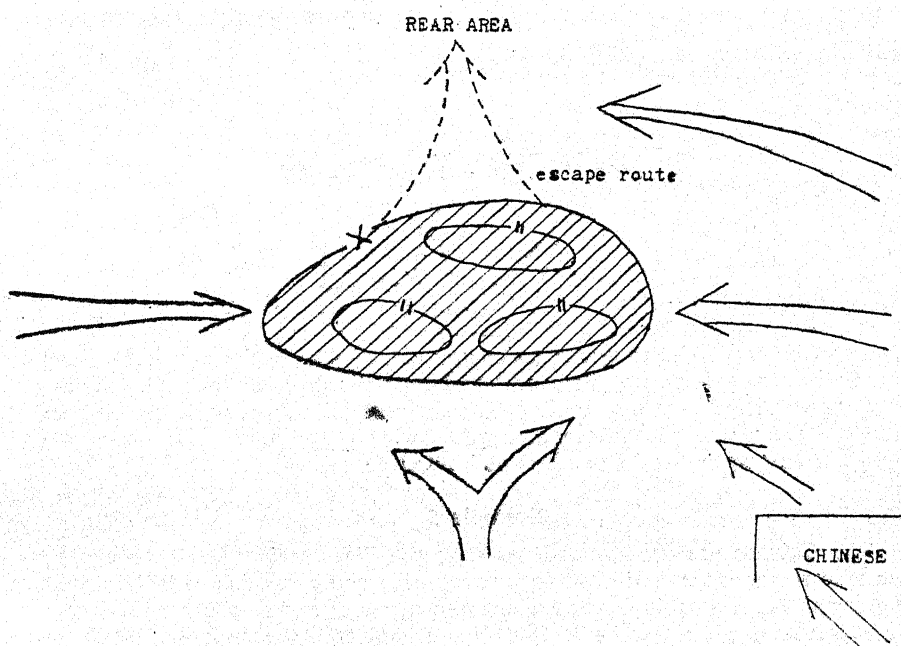
Example 1

The Chinese are very painstaking in staging feints at various points. The main attack will, however, be directed against a weak position in overwhelming



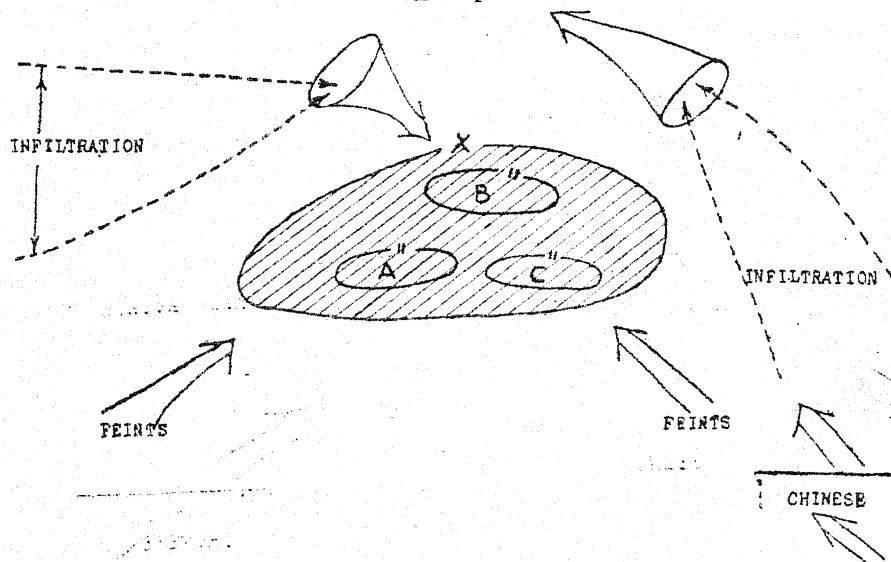
numbers—superiority of 5 or 6 to 1. A force will be earmarked to cut off the lines of withdrawal.

Example 2



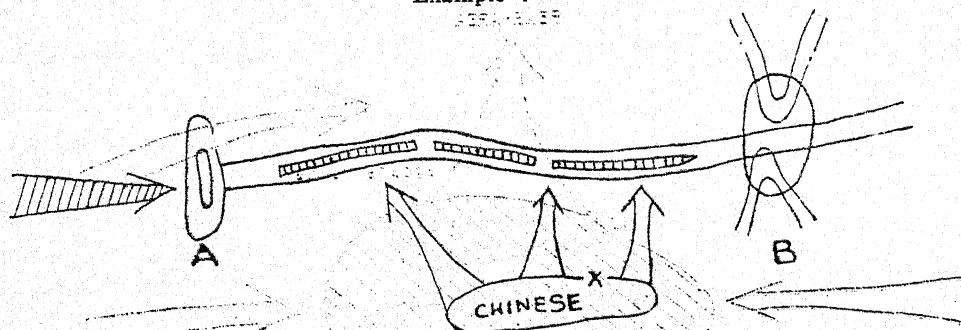
This is an attack by encirclement. Attacks are staged from three different directions in overwhelming numbers. An "escape route" is left free. Should the enemy decide to escape by this route, a force especially earmarked will take care of him.

Example 3



By a process of infiltration, a large force is assembled in the rear of the position, while feints hold attention to the front. When the force in the rear is large enough, the enemy is struck from the rear.

Example 4



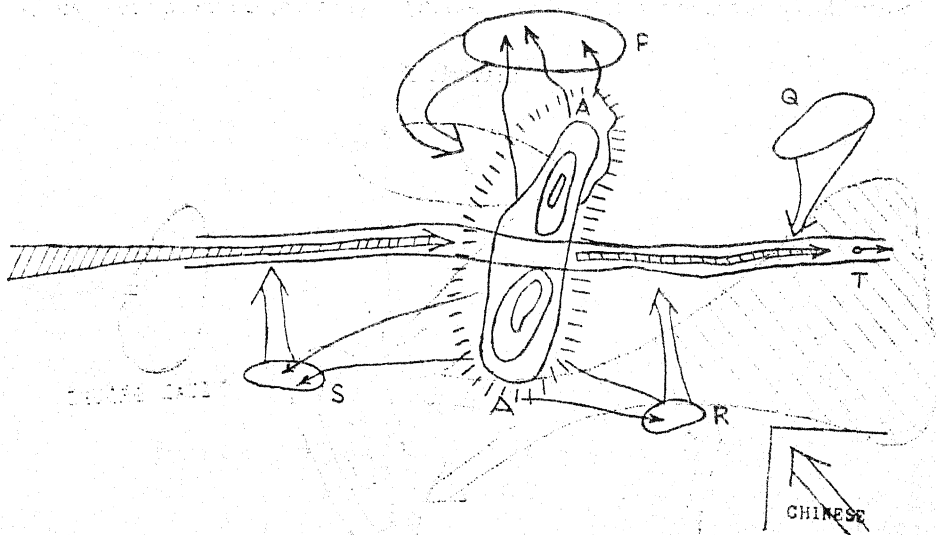
The Chinese prefer to attack an enemy while he is on the move. A small force holds him frontally, while a powerful thrust is made at the main body—the withdrawal routes are sealed off. The Chinese initially may be at A, from where they give the appearance of a hasty withdrawal to B, thus luring the enemy into a trap where he can be annihilated on the move.

Example 5

The Chinese are encountered at A, in the diagram in the opposite page from where they stage a withdrawal by scattering and collecting at P, Q, R and S. A small force at T lures the enemy into a pursuit. As soon as the enemy is off-balance, the Chinese at P, Q, R and S collect and attack the enemy in overwhelming strength.

The Chinese are very painstaking in personal reconnaissance and commanders at all levels are keen to see the ground for themselves. The preparations are thorough. A very important factor to note is Sun Tzu's maxim: "All

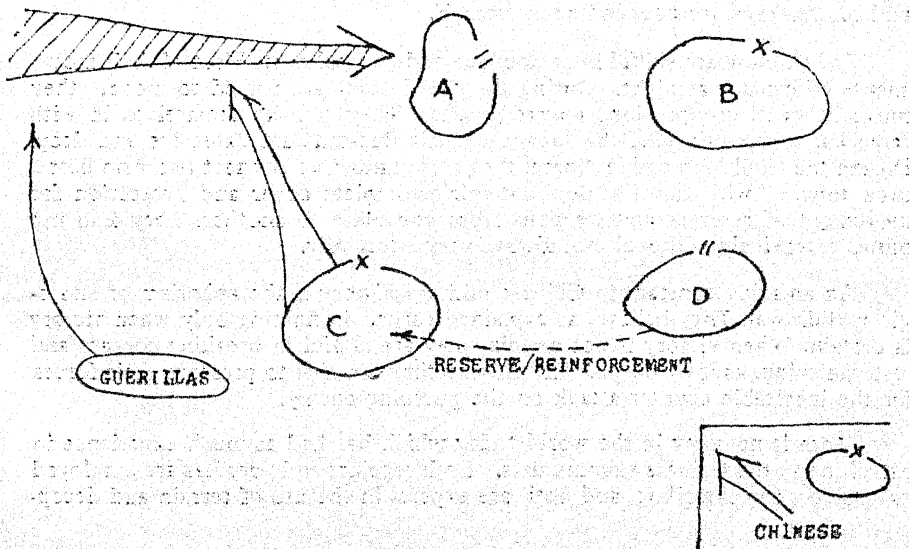
Example 5



warfare is based on deception . . . supreme excellence consists in breaking the enemy's resistance, without fighting." Every move is directed to this end. Once plans have been made, rapidity in execution is the essence for which mass mobility has been so assiduously practised.

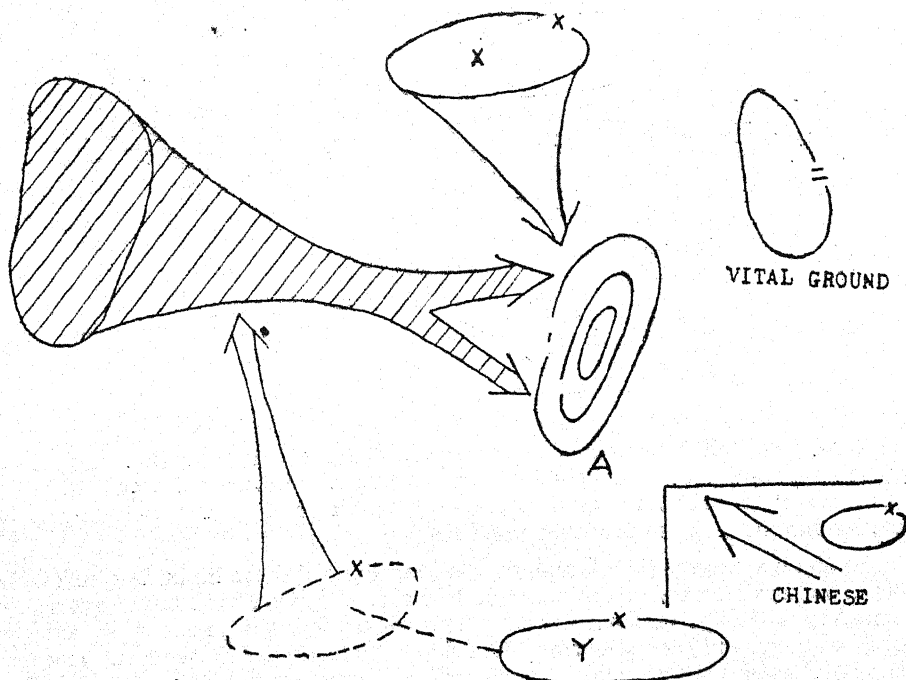
From all accounts, the Communist Chinese do not believe in fixed defences. This is perhaps a legacy of their guerilla heritage. They are used to concealing themselves in groups of ten to twenty thousands, especially in mountain and broken country, and then pouncing suddenly on the enemy. This seems to have become an established pattern. The defences are organised not as a continuous line, but in firm island bases, ranging in strength from a battalion to a divisional group as illustrated in the following examples:

Example 6



The enemy chooses to attack the Chinese at A as illustrated in the diagram (previous page). A powerful thrust is directed at him by the Chinese from C, when the enemy is in the process of attacking. Till then, C remains concealed.

Example 7



The enemy is lured on to A, which is dominating ground. Before he has had time to reorganise on the objective, the enemy is counter-attacked from X, and his reserves are pounced upon from Y.

The Chinese are skilful in camouflage and concealment. Most of their movements take place at night. During the day, if they are forced to move, they move in small groups along covered routes. They can dig themselves in with remarkable rapidity. Like the Japanese, their dug-outs are extensive and deep. During the Civil War and in Korea, they were known to connect two firm bases, even towns, with tunnels, thus obtaining complete cover and protection for movement of reserves and weapons from one place to another. They also use mines extensively, although not always very effectively.

An amazing constant in Chinese military history is the aphorism of strategic withdrawal. They believe, as explained earlier, in fighting only when victory is certain. When victory is not certain, they are skilful in breaking contact and just vanishing, as if by magic. In this way they are able to preserve their forces for the inevitable counter-attack on the pursuing enemy.

There is no army in the world today which has had as much experience in patrolling as the Chinese Communists. Both regulars and guerillas are employed extensively for patrolling, and both are experts in the use of terrain and decep-

tion. Patrols are bold and carry out a variety of tasks, for example: reconnaissance; jittering and harassing; ambush; raids on administrative echelons; foraging.

The elemental tactics of the Chinese can be summed up as follows in the words of Sun Tzu: "All warfare is based on deception. Hence, when able to attack, we must seem unable; when using our forces, we must seem inactive; when we are near, we must make the enemy believe that we are far away; when far away, we must make him believe we are near. Hold our baits to entice the enemy. Feign disorder and crush him."

There is an astonishing similarity in some of the tactics used by the Japanese during the Burma campaign and what the Chinese are known to practise today.

CONCLUSION

The PLA is one of the largest armies in history, but despite its enormous fighting experience, it has numerous weaknesses in organisation and equipment. These weaknesses are being corrected rapidly.

There is nothing new or unique in the Chinese tactical concepts. In fact, the age-old Chinese dictums have, if anything, imparted a very rigid form to their tactical concepts, which are based primarily on ruses or stratagems and the employment of the mass.

I should like to end with these words from Sun Tzu's Art of War: "If you know the enemy and know yourself, you need not fear the results of a hundred battles. If you know yourself, but not the enemy, for every victory gained, you will also suffer a defeat. If you know neither the enemy nor yourself, you will succumb in every battle."

DILEMMA OF THE TECHNICAL STAFF OFFICER

By Major TARLOCHAN SINGH, Engrs.

INTRODUCTION

THE Technical Staff Officers course has been in existence for more than ten years. In spite of the great emphasis on the necessity of technical and scientific knowledge for modern warfare, the course has not become very popular with the "bright" officers of the Army. The right type of officers are not coming forward to join the Technical Staff. It is, therefore, time that more positive thought is given to this vital problem.

STATUS OF "PTSC"

It seems that "ptsc" has failed so far to achieve due status and recognition in the Army. An officer who is entitled to put "psc" after his name after undergoing a ten-month course at DSSC, qualifies himself for senior appointments. "PSC" is a symbol of recognition that he has reached a high standard in his profession. On the other hand an officer who logs for two years in the Institute of Armament Studies to get his "ptsc" and then puts in a tenure on technical staff would seem to have prejudiced his regimental career. For higher promotion in the Army his service with the Technical Development Organisations is not considered with favour. After being away on such ERE appointment, he is generally not welcomed back in the fold of the regiment while a "psc" with staff appointment becomes a great asset to the regiment. The old stigma when TD officers were wrongly or rightly considered as not very good for regimental duties somehow still lingers in certain cases though in a much diminished form. Therefore, the "bright" officer who is sure of his chances in the regiment thinks twice before joining the Technical Staff.

There is no gainsaying the importance of technical officers in this age where the technician and the scientist has a decisive influence on warfare. Why then should the status of the "ptsc" be lower? The problem is analysed in the succeeding paragraphs with the hope of arriving at a satisfactory solution.

RECOGNITION OF STATUS

Let us be clear about two things in regard to the recognition of status. Firstly status cannot be imposed upon. It has to be recognised by others. In the case of TSOs, they exist and work for the service of the Armed Forces. The recognition of their status should, therefore, come from the Services. The fact should be admitted that in the final analysis the Services decide the issue. Therefore, an imperative and honourable demand has to be created in their minds for the inescapable need and usefulness of TSOs. At present such a demand is not very keenly felt by the Army as is evident from the holding in abeyance of TSOs' appointments in various Headquarters as mentioned in the Special Army Order. Sometimes the duties of such officers, even if appointed, do not seem to be very clearly defined.

Secondly, it is the individuals constituting an institution who raise its status and command recognition by their useful work. In order to produce results there should be persons in the organisation who can formulate

positive ways of achieving a higher status and recognition for Technical Staff Officers than has been attained so far.

ATTRIBUTES OF TECHNICAL OFFICER

In order to formulate the attributes of a TSO we should first know what role is his and what qualifications he should possess to discharge that role effectively. This role as given in the Special Army Order is as follows:

"At present all activities pertaining to men and equipment are controlled by the staff at various levels. Owing to the nature, complexity and immensity of problems connected with equipment, it has been decided to create a separate technical staff for dealing with them. The technical staff officer will be a general purpose officer and will deal with all problems connected with equipment and stores. He will also advise on the technological warfare and on the use and trial of new equipment."

The fundamental function of a technical officer is to be able to influence the use and development of war material. For holding higher appointments he should also be able to determine military policy in relation to weapons and organisations. He should be a sound regimental officer and fully aware of the problems regarding the employment, use and capabilities of weapons and equipment in the operations. For the effective solution of battlefield problems, he should bring to bear his technical and scientific knowledge. He is a good blend of a regimental soldier and a technician having a high standard of knowledge of both aspects. His job, therefore, is not an easy one. A military technician (TSO permanently seconded to TD Organisation) covers a wide range of attributes. The problems confronted by him calls for the ability for the application of advanced scientific and technical principles to the realistic problems relating to the use, development and design of military weapons and equipment.

MINIMUM QUALIFICATIONS

A Technical Staff Officer or a military technician must be technically qualified and must have:

- (a) Sound regimental knowledge and experience to ensure a good grounding in the use and employment of equipment in the operations.
- (b) A degree in Science or Engineering or its equivalent to understand the scientific and technological principles.
- (c) "Ptsc" to know the effective application of his knowledge and experience for the improved use and development of war material.

These qualifications are the bare minimum. Relaxing any one of them will affect his capability to discharge his role properly. The need for a technical officer or military technician will only be felt in the Army, if by offering practical solutions based on his wide technical and regimental knowledge, he can effectively contribute to a quicker and easier victory on the battlefield. If he cannot do this, there may not be any need for him.

EXPERIENCE AND KNOWLEDGE

Experience is a very valuable asset in all technical organisations. But long experience alone in the organisation does not mean that the person has become an expert in his job. He should also possess a good technical knowledge and the ability to apply that knowledge. A technically qualified

person with knowledge and a few years' actual experience will be far superior to a person having long experience and no higher knowledge. In the fast developing technical world, old experience tends to be old fashioned and out of date. Experience of latest developments though short is more valuable than experience of outmoded techniques though long. For higher appointments higher knowledge becomes essential along with experience.

It is a fact that some persons worked wonders without proper training and higher education. But such cases are rare. We have to deal with common people and it is accepted that they do require high technical education, proper training and conscious experience for becoming good military technicians. In the development design of war material, there is little evidence of the use of intuitive flare. It is the outcome of the application of well-known engineering and scientific principles. Apart from a notable exceptions, the essential requirement of high technical qualifications commensurate with their role does not appear to be fulfilled at present by some military technicians especially those of the Armaments Division.

STANDARD TO BE RAISED

It will be a move in the right direction if it is made absolutely clear what qualifications are essential for military technicians. At present only general standards are indicated. Though it is appreciated that cases are considered on individual merits, it will be in the interest of the service to make the position clearer. While the minimum standard has been laid down for the subordinate services, *e.g.*, an engineering degree for Assistant Foremen, Foremen, etc., there is no such provision for officers. This has resulted in a large number of military technicians without basic engineering and scientific qualifications. Where the subordinate staff is required to have a minimum engineering degree as the basic qualification for recruitment to the service, it is necessary that the controlling staff, *i.e.*, officers, should have at least the same if not a higher qualification for the proper guidance of work which is supposed to be technical. Officers who have failed in 'ptsc' or those awarded 'ptsc' after seven or eight attempts obviously do not make the grade for senior technical appointments. It is imperative that the standards must be raised if the institution is to be accorded its rightful place.

SELECTION

A competitive examination followed by an interview should be introduced for the selection of technical officers. The selected officers should have at least the minimum technical, regimental and general standards laid down.

It is considered that an officer should have ten years regimental service before he enters the technical cadre. This will give him experience of the use and employment of weapons and equipment and the required maturity to embark on design and development work.

It is emphasised that once an officer is selected for technical appointment, he should stay in the technical organisation permanently. He can refresh his regimental knowledge by a few months attachment with an active regiment every second or third year. A technical officer who shuttles between regimental and technical tenures may not be a success on either side. Technical development requires long and concentrated study and hard work to achieve results. It is imperative that technical officer should be kept devoted to his work once he chooses and is selected for the technical cadre.

TRAINING

"Technological advance is now not the result of the accident of inspiration or genius but of high purposeful effort. Machines do not improve themselves, they are product and tools of improved men."

The purpose of the training for a technical officer is to produce improved men capable of purposeful effort. It is essential that the military technician should have the ability to perceive problems of design and development, e.g., a structure may be stressed to carry the expected load, but if it is not perceived that the condition of the load will lead to fatigue, wrong calculations may be made. He should also be able to imagine the object of completed design passing through the subsequent processes of manufacture, assembly, inspection, transport, erection, operation and maintenance considering at each stage what snags may emerge and how they may be achieved.

The technical officer should also have training in the logical procedure and process of design. This is essential to produce competent military technicians who will form the backbone of design and development of war material. This work requires acute awareness of the material world together with highly developed powers of analysis. The training must include project designs. An advanced knowledge of background subjects e.g., Mathematics, Applied Mechanics, Strength of Material, Theory of Machines, Thermodynamics, Electrical Engineering, etc., is pre-requisite to applied design work. While teaching design the projects could consist of typical military weapons and equipment problems laid out in terms of specifications or particular requirement for particular application. They may, however, give the student sufficient latitude to enable him to develop creative and inventive abilities and at the same time to use his background knowledge in their solution.

CONTROL OF CAREERS

The present system of controlling the career of "ptsc" officers by the Technical Organisations is considered not satisfactory from the point of view of career planning of Army officers to the requirements of the Army and to fit them properly in the regimental structure if and when they return to regimental duties. It is suggested that the career of "ptsc" officers serving in Technical Organisations should be controlled by the Military Secretary as is done for officers belonging to other organisations under the Ministry of Defence. For dealing with "ptsc" officers, a special section may be set up under the Military Secretary corresponding to that dealing with "psc" officers. For "ptsc" officers there can be a separate Selection Board with some technical experts coopted as its members.

CONCLUSION

The status of "psc" has not yet achieved its due recognition in the Army, and the right type of officers are not coming forward to join the Technical Staff. We need well qualified persons who with their achievements of high calibre can bring a better measure of status and recognition to "Ptsc" than has been attained so far. To produce positive results, the technical officer must have high technical qualifications, have proper training and adequate experience. If every military technician attains the practical ability to influence the use and development of war material and thus materially help the Army in winning the war more speedily and with lesser effort, the technical officer will be well on the way to success.

FIGHTING THE GUERRILLA

By Major R. D. PALSOKAR, MC, Brigade of the Guards

"Give me a handful of professional guerrillas
and I will overrun the established order"

—Lenin

INTRODUCTION

AMONGST the many tasks the army is required to carry out, fighting the guerrilla is one, and it requires a technique of its own. Principles of attack, however rigidly adhered to, do not produce any results because there is no single specific objective to be captured. The opponent does not hold any ground. He has to be sought, fixed and then destroyed. He cannot easily be sought, leave alone fixed to be destroyed. Instead he finds it comparatively easier to harass his adversary, who spends most of his effort in maintaining and protecting his command. A guerrilla band can hold twenty to thirty times its strength and if led well can truly spell disaster for the regular army especially if the terrain is difficult to operate in. When the military commander is exasperated trying to lay his hands on this will-o'-the-wisp, he tries to find consolation in saying that the whole problem is political—not military. The politician, on the other hand, calls it an obvious military task. How can he hope to establish order when there is no security anywhere? He feels that he has handed over the job to the army who should first establish law and order.

AIM

It is intended, in this article, to discuss how best to fight the guerrilla. Since a guerrilla fights for achieving a political aim with military means, he has to be fought back simultaneously on both political and military fronts. The subject is, therefore, discussed from its two main aspects, *viz.*, political and military. The military aspect is dealt with mostly from the point of view of an infantryman who is normally detailed for this onerous task.

A guerrilla is defined as one who takes part in harassing an army by small bands. There are two types of guerrillas. One takes to arms against an alien army like the Maquis in France or the partisans of Yugoslavia. The other fights his own compatriots like the Russian or Chinese communists who adopted guerrilla tactics to overthrow the government of their own people. In this article the term guerrilla or hostile is used to denote the latter type who fights his fellow countrymen.

POLITICAL ASPECTS

Origin and growth of the struggle: When a section of the populace belonging to one nation believes itself different from the rest either ethnologically, culturally or ideologically and finds that it cannot assert itself politically or is being exploited in the economic field, the older element tries to follow constitutional means to achieve political and economic objectives while the younger element takes to arms and begins an armed fight to overthrow established authority. Out of the latter is born the guerrilla who organises his kind into small bands. With the support of the people, the hostile armed bands move about freely from place to place preaching their cause as

they move. They may establish small camps in isolated areas to train new entrants in the handling of weapons. Their simple logic that they have taken to arms and are prepared to give their life in a struggle unto death to achieve their goal makes them heroes in the eyes of their people. More followers join and the movement gains momentum. Those who do not support their views and do not approve of their methods need not give them active support. So long as they keep the information of their whereabouts and movements to themselves, they serve the purpose. Others dare not oppose them openly for fear of reprisals in the name of the 'cause' or for being dubbed as unpatriotic by their own kith and kin.

Fighting the "belief of being different": If this feeling of being unlike the rest has to be eradicated from the minds of a section of the people, it cannot be done by keeping them aloof or by laying stress on the apparent differences. It must be brought home to them that they are not different from the others and whatever apparent dissimilarities exist are such as would be found between any two sections of the population which are separated by a few natural barriers. The realisation that they have something in common with the rest will alone keep them together. If people are deliberately kept aloof by restricting movement into or out of their area, they will never consider themselves the same as the rest.

Fraternization: When the army is given the task of fighting the guerrilla it cannot do so by dissociating itself from the people because the guerrilla depends for his very existence on the people. It should allow its ranks to fraternize with the people to the same extent as it would do in any other part of the country. The policy of fraternization will have two main advantages. Firstly, it will help to foster the feeling that the army is not an alien force but belongs to the people. Secondly, it will facilitate collection of information regarding the movement of hostiles. It is true that information of hostile activities can be obtained more easily by using third degree methods, and troops tend to become impatient when they suspect that someone is deliberately trying to non-cooperate. But patience and forbearance are far more rewarding in that the people do not get confirmation to their thesis of being different to the rest.

The importance of propaganda: Every individual guerrilla is convinced that he is fighting for a 'cause', tries to convert more people to his way of thinking and lives on their support. The effective way of denying him this support is to bring home to the society aiding him that he is not fighting for the right cause. This can be done effectively by employing professional propagandists for this purpose.

Unfortunately there exists a tendency in democratic nations to under-rate the value of propaganda. In the name of freedom of expression the people are liable to be told the untruth more forcefully and led to believe it. Doubts may be cast in their minds about democratic values. This may not have adverse effect where political institutions are sound and therefore less prone to crisis. But in under-developed democratic nations such freedom may sound the death knell of democracy itself. It is now well established that an entire people may be taught to think on similar lines if their government controls the press, the radio, the schools, the teachers and the books.

Whilst it is not the intention to suggest that such a method so repugnant to democratic ideals be followed in ordinary circumstances, it is absolutely essential to take resort to it for training people to democratic way of life and to achieve national integration. The society supporting the activities of the guerrilla must be made to realise that he is misguided and fighting for the wrong cause. This can be achieved only by intensive propaganda.

Army's role in propaganda: In many places the army reaches the people before the civil administration does. In certain areas civil administration may not be able to function for months on end either due to terrain difficulties or hostile activities. The army should therefore take active interest in the propaganda campaign. An infantry division has no propaganda machinery of its own. If it is to help the civil administration in this respect, it is essential that some sort of a quasi-military organisation whose main function is to effect national integration is superimposed on the present organisation of the infantry division detailed for this task. The organisation should have at its disposal modern means of propaganda and specially trained propagandists. Members of the organisation should mix freely with the people, help educate them and generally gain their confidence. They should be able to speak the language of the people, be possessed with a missionary zeal and prepared to work independently if necessary. The men of this organisation should be posted at division, brigade, battalion and even company level as infantry companies establish independent posts under such circumstances.

MILITARY ASPECTS

Characteristics of the guerrilla: The guerrilla organises himself into small armed bands which live on the land. Consequently he has no administrative tail. His camps are well hidden, generally well stocked with rations, medicines and other provisions and it does not really matter to him if an odd camp is destroyed by the security forces. He can merge with the local population at will—in the words of Mao Tse Tung "like fish in water". With the active help of the people or by terrorizing them, he keeps his movements secret and is well informed of the movements of the security forces. His tactics consist of sniping, ambushing or raiding army columns or posts. He avoids pitched battles.

Organisation of an infantry battalion: An infantry battalion is designed to close with and destroy or capture the enemy and to hold ground. When it is engaged to fight the guerrilla who does not allow it to close with him and who seldom if ever attacks the ground held by it, the present organisation is unsuitable for the new role which should be 'to seek and capture or destroy a hostile or guerrilla and help in integrating the local population with the rest of the nation'.

Anti-tank guns, 3-inch mortars and pioneers are seldom required. The heavy weapons may be discarded (depending upon the arms used by the guerrillas) and the men thus released employed to form a fifth rifle company. Rifle companies can also do without 3.5 inch rocket launchers and anti-tank grenades. The proportion of light automatics particularly the sten should be increased. Since the new role is to seek a hostile, personnel and equipment which will help this purpose e.g. tracker hounds, infra red binoculars etc., should be issued. Where possible more light vehicles such as jeeps, helicopters,

(if the country can afford them) may be made available. Light wireless sets like the 88 set are invaluable.

To enable fulfilment of the other part of the role, *viz.*, to help in achieving national integration, it is necessary to superimpose a small organisation on the present infantry battalion as brought out earlier. Even the men will need to be trained.

Training of troops: It is necessary that troops are trained in their new role before being launched into operations. Troops should be trained to live and operate in the jungle and mountainous terrain similar to the one in which they are to look for the hostiles.

Collecting intelligence: The importance of obtaining information of hostile hideouts, camps or their movements cannot be over emphasised. Information does not always come in time to be acted upon. In fact, even if received late it may prove quite useful. It should be compiled and carefully studied over a period of time. Such a study generally reveals a certain pattern of hostile movements such as their frequenting certain routes or tracks more than others, visiting certain places on particular days of the month and the like. This pattern if known is useful in laying ambushes.

Without prior information, to look for guerrilla hideouts is like looking for a needle in a haystack. Since the local population is sympathetic to their cause chances of getting guides to their camps are remote. Possibilities, however, always exist that some of the locals may have been ill treated by the hostiles and one of them may decide to lead the security forces to their camps. Since a guide risks his life, his identity should be kept concealed and his personal security subsequent to the operations guaranteed.

Patrolling: Patrolling along beaten tracks without any specific object except to dominate certain areas has little value except in toughening the troops. It is tiring, boring, demoralising and does not in any way contribute to effectively fighting the guerrillas. Patrolling along *nalas* or re-entrants thick with jungle with 30 to 40 men similarly seldom produces results.

Ambushes: Whilst guides are hard to obtain and patrolling along tracks or re-entrants is a waste of energy, ambushes laid after a careful study of the pattern of guerrilla movements are more likely to be successful. Such ambushes should be laid with as few men as possible. A strength of one NCO and 4 to 5 other ranks armed with one bren gun and light automatics can effectively ambush a party four times their strength. Small parties carefully rehearsed in their role are easy to hide and a rifle company can at a time produce a large number of such parties.

The commander laying ambushes should bear in mind that chances of success increase in direct proportion to the number of ambushes laid.

In order to search a given area of jungle it is best to establish a firm base in the jungle and operate from it. Troops sent from a firm base outside the jungle cannot carry out the task effectively. Living and operating in a jungle requires special training. Troops trained for their normal role cannot do it.

An infantry soldier who is required to spend a few nights out normally carries 58 to 60 lbs of weight. This includes his clothing, weapon, ammunition and one magazine of bren. He cannot therefore carry more than 10 to 12 lbs of rations on him. He can thus move self-contained for five days at a time. If he is required to operate for longer periods, arrangements must be made for the rations to be carried for him. These can be dumped at the base from where he is to operate.

Use of local militia: The best troops to hunt the guerrillas are those that are recruited from the local population—the local militia or village guards. These men know the countryside as well as their adversaries do and are naturally well up in junglecraft. They should not be used for static duties such as guarding of posts or installations. In such a role they are likely to feel bored and subject to defection. Their primary role should be to hunt the guerrillas and they should be kept moving for that purpose. It will be noted that the local militia will always get more and better information than their opposite numbers in the security forces.

Importance of rehearsals: Whether regular forces or the local militia are employed in laying ambushes or raiding camps, it is essential that the men are rehearsed for each operation. Each raid or ambush is a separate new operation by itself unlike anyone before. Every man has to be told what he is required to do. If this is not done, men get confused and are likely to do the wrong thing at the right time. Troops may be generally well trained but for such operations individual roles have to be explained and rehearsed.

CONCLUSION

Fighting the guerrilla is a combined political as well as military task. Since the guerrilla is born out of a feeling that his people are different from the rest, the main effort should be diverted towards eradicating this feeling and trying to integrate the local population with the rest in the country. "Omnia vincit amor"—'love conquers all' is a good principle which both the civil administration and the army should bear in mind. Full use should be made of the modern propaganda methods in this task of national integration. A quasi-military organisation should be superimposed for this purpose on the present organisation of the infantry division engaged in such operations. If the role of the infantry units is changed suitably, changes in organisation to meet the new role will naturally be forthcoming. Full use should be made of local militia for active operations. Whilst patrolling along tracks or re-entrants has little value, ambushes and raids on camps pay greater dividends in bringing guerrilla activities under control. Each ambush or raid should be well rehearsed before men are sent out.

LIMITED WAR AND AIR POWER

By Sqn. Ldr. E. R. FERNANDES

EVOLUTION OF WAR

SINCE men learnt to live in a community, the characteristic human jealousies and rivalries have led to conflicts. In these conflicts between independent communities, which existed in the form of tribes, organised states and nations, the concept of war was found. In a war, from the immemorial past the respective strengths of the warring camps were measured on the battlefield. The armed force of a nation that faced the enemy was independent of the home front, and therefore, success or defeat at the battlefield determined the fate of the nation. In the later centuries it was the outcome of a series of battles that sealed the issue, but nevertheless the military potential of a nation was reflected exclusively in its standing armies.

With industrial progress and technological advancement, warfare became more complex and the military potential of a country did not confine itself to the mere men in arms and their fighting equipment, but extended to, and was inextricably enmeshed with, the supporting capacity which the industry could sustain. The industrial output, in turn was dependent on the communication system, administration and morale of the people. The classic examples of such a war, where the total industrial capacity of a nation was geared to the will to wage war, were the last two world wars. The concept of a war consequently changed. It, quite rightly, came to be known as a total war, in which energies of all kinds are mobilised and geared to the dominant purpose of imposing one nation's will on that of the other. However, attacks on the home front were restricted by the forward zones of combat which had to be effectively breached in order to reach the heart of the enemy. But with the advent of air power the conditions changed markedly.

Air power was the single factor which enabled nations to break away from the limitation of the old concept and effect third dimensional envelopment to take the war into the home front even before the initial clash of the surface forces. The primary weapon of the air forces, the instrument of air power, is the strategic bomber force with the capability of carrying destruction deep into the enemy territory, against the war making potential.

Weapons assumed predominant significance in the concept of wars and in conditioning their strategies. Their destructive power was increasing rapidly, until, with the successful splitting of the atom, they became absolute in character. After the Second World War, the world political reorientation set in into two distinct camps, each nursing an ideological concept but in conflict with that of the other. These camps are those of the Western democracies influenced by the U.S.A. and the Communist bloc dominated by the U.S.S.R. Nuclear warfare potential grew in both these camps until it became absolute by the very nature of the tremendous destruction it contained. Stockpiling of nuclear weapons has reached a point where the offensive capability of each side has become saturated. A total war could now only lead to mutual suicide. It can no longer be considered a continuation of a sane national policy. The major powers have thus been denied the choice to wage a total war. They were forced to pause, but in the meantime a new concept of war—the cold war—was born. The serious rivalries continue to emphasise the gap that exists between the two ideologies, and the war that ensues is manifest in all

forms short of direct military operations. But the very nature of forced restraint on the employment of weapons of mass destruction in a direct major conflict, has favoured indirect action which is intimately influenced by the intangible forces of the cold war. Indirect action leading up to limited military operations are manifest in localised wars as the result of externally inflamed nationalism or instigated uprisings against established authorities. Such wars are limited by the nature of the weapons used and of the geographical confines. In these wars the political aims too would have limitations. This type of war has come to be known as a "limited war".

A limited war is the progeny of the present world political situation and is tempered by the uncompromising nature of the two ideological concepts. Communism derives its power from its tight control of governments. Its aim at international communism influences its grand strategy which does not preclude aggressive spread even with the use of arms. In such a strategy the West cannot be strictly excluded as was exemplified in the Anglo-French adventure in the Suez in 1956, but the action of communism would be more indirect in approach and the significance of a limited war would more easily prevail.

In any state, a small political body that is swayed by the communist doctrine could, given the necessary military facilities, overpower the existing rule by mere force of arms. The aim would of course be to bring the nation under communist influence through a despotic pressure. When such opportunities exist in many under-developed countries limited wars could easily flare up. The time and place of the war would be unknown until actual hostilities commence. The free world partaking in such a war would necessarily undertake a defensive operation, one of repelling aggression and recovering lost territory. The peculiar characteristic of this war would afford the enemy the advantage of initiative and the freedom to apply the principles of economy of force, surprise and concentration. The required counter-measures must aim at containing the enemy before his immediate objective of overpowering the established order is completely achieved, and then re-establishing the status-quo of the nation. Since World War II, the communist strategy was projected clearly in Burma, Malaya and Indo-China. Limited wars in varying degrees were fought in Indo-China, Korea and the Suez. Perhaps the best example of a future limited war is the Korean conflict. Doubtless, there will be change of emphasis on the extent of the enemy military forces, on limitations of weapons used and on the geographical limits. Nevertheless, the pattern of conflict is not expected to change very much, and therefore, the discussion of operations in a limited war is based on the Korean War concept.

REQUIREMENT OF FORCES

The type of forces that would be required in defence of an area or a state which is subject to a sudden attack, would not conform to those that are best employed against a major power in a total war. It would be very much a tactical employment in the context of the present character of a total war. The use of nuclear weapons cannot be precluded, but these would be necessitated by the need to increase the fire power capability of the artillery and the employment would be tactical in character. The forces employed would be light and mechanised, convenient for easy transportation and not requiring a very complex supporting echelon. The nature of the country would normally be such that heavy mechanised units would soon get bogged for want of adequate communications. The area of conflict might be thousands of miles away from

the main bases from which sustenance for a continued support is derived. Heavy artillery would perhaps be a luxury and even the number of troops would be limited. The aim of the big powers would naturally be to limit the conflict in order to avoid a global war. Military activities would, therefore, be necessarily limited within a specified area. It is in this context that the study of air power is made as an effective weapon in influencing the outcome of a limited war.

AIR POWER

It is a well known concept of air power that its might is wielded through the strategic bomber force. Generally, the aim of Air Forces is to exercise air power to achieve air superiority through which to apply the air offensive capability. The primary aim is to destroy the war-making potential of the enemy in his home territory. The secondary aim is to provide support to the ground/naval forces in the form of transport, close reconnaissance support, etc. In the case of a limited war, however, it demands a change of concept in the employment of air power.

STRATEGIC MOBILITY

The enemy's intention would be to concentrate sufficient forces at a given place and time as to enable him to over-run the required sector before any outside influence could be brought to bear on the progress of his operations. With each day that passes, the effort required to reconstitute the "status quo" may present such difficulties and costs that one may be unwilling to accept them. The speed of movement of the defence forces, therefore, once the political decision is taken, is both vital and critical. To convey these forces by sea or land might well be the loss of the area to the enemy much before the forces could get engaged. The alternative, and the only one which assures quick mobility, is through air transport. Thus strategic mobility of forces to the area of conflict is paramount.

The U.S.A. has established a strategic army corps which is a strategic strike force capable of rapid development anywhere in the world. On May 13, 1958, a task group of this force was alerted for a mission 1,600 miles away. In a little less than nine hours the first aircraft landed at the destination, and in 16 hours the task group was ready for combat deployment. The group consisted of 560 men, a full complement of weapons, 59 vehicles, one helicopter, a basic load of ammunition, four days rations and all the necessary equipment required for an airborne assault. The short time within which the move was completed, was made possible entirely by air power. To bring about a strategic move of a substantial defence force, the need arises for high speed, very long range transport aircraft. In addition, these transport aircraft would be required to maintain the logistic support from their home bases until the sea lanes and land routes are effectively put into use. It is unlikely that this strategic army corps will remain divorced of integral air forces, suitably balanced into a composite wing. This wing will have to undertake tasks as quickly as the ground forces seen presently. Strategic mobility would, therefore, also be extended to this wing (except aircraft that would be flown with long range tanks) as part of the strategic forces.

AIR SUPERIORITY

Immediately on assuming responsibility of defending the aggrieved nation, any form of operation could only be carried out within a favourable air situation. In the Korean war the air opposition was slight, and even when the

elements of the Chinese Communist Air Force actively participated later on, the whole air offensive was ineffective due to various reasons. This deficiency in the air was only too well appreciated by the enemy, and therefore, in future limited wars, aggression may well be supported with a much better qualified air component. Air supremacy would, therefore, have to be fought for. It would be the primary tactical requirement, without which ground/naval operations might become untenable. Further, the landing of the strike force will have to be protected, and therefore, the fight for air superiority would start simultaneously with the arrival of the strike force. In fact, it would be well advised to accommodate the fighter element in the force-echelons of the transported forces. Air superiority would be a regular requirement until the cessation of hostilities. This situation would be achieved by fighter-bombers in providing air defence cover to the vital points and areas and also attacking the enemy aircraft on ground. The air defence might well be supported by S.A.G. weapons. The light/medium bombers would concentrate on attacks against the airfields, aircraft on ground, hangars, and such immediate installations which support the enemy air offensive.

RECONNAISSANCE

The sudden outbreak of hostilities would make it extremely difficult, if not impossible, to estimate the enemy strength and deployment of his forces. Planning and tactics are conditioned largely by these two factors. In the initial stages of the war the cloud that obscures the strength and deployment of the enemy, has to be lifted. Until that time, the ground forces would operate at a disadvantage of fighting the enemy whose offensive, defensive and counter-offensive capabilities are not known, except in the immediate front line. Air reconnaissance, both photographic and visual, would be the only way of easily lifting this cloud and thereby providing a sufficiently clear picture to the commanders. It would also give the required information to plan the strategic support echelon tied up over thousands of miles. Moreover, it may not be unusual for the area of conflict to be partly uncharted with the consequent implications of further fogging the tactical plans at all levels.

During the progress of the war reconnaissance will play a very important part in providing commanders at all levels the information about the enemy in depth. Such information would be invaluable both in short term and long term planning. In the sphere of air operations, information about targets through air photography, etc. would be indispensable in planning the attacks and choice of weapons. Damage assessment is another important requirement which cannot be overlooked.

CLOSE SUPPORT

The ground force would necessarily be lightly equipped, devoid of heavy long range guns. Supplementing this deficiency the fighter-bomber aircraft would become an essential adjunct of the ground forces. As demonstrated in Korea, close support did, at times, substitute for artillery while normally it was extensively used against marginal targets. During the last two years of the conflict about 30 per cent of all air force sorties were flown in close support, as opposed to roughly 10 per cent in the European theatre during World War II. Flexibility of air power also permitted active employment in order to plug the weak spots of the friendly ground forces during a withdrawal. This was amply proved during November, 1950 when the Chinese Communist Forces swelled across the Yalu River and launched their offensive. The geographical limits of the war made the task of the air force more difficult. The

U.N.C. ground forces were compelled by the overwhelming enemy forces to fall back with severe losses. The enemy advance had acquired a great momentum, but as the distance increased from Yalu River air power made itself felt and his advance was slowed down.

INTERDICTION

Interdiction is a very important responsibility of a Tactical Air Force. It would be necessary in a limited war to employ a good proportion of air effort towards achieving effective interdiction, in which the operations of both fighter-bombers and light/medium bombers will be concentrated in isolating the battlefield, and the enemy starved of food and equipment. The enemy would be able to concentrate large lightly equipped forces as reserves in support of his forward troops. The constant threat posed by the enemy would be in the nature of saturating the battlefield with manpower. It is in this light that isolating the battlefield would, if not stop the marching in of troops, seriously affect the supplies of ammunition, food and other resources. This nature of battle contact, where manpower is dependent only on small arms, would probably be the normal feature of a limited war. Except, perhaps, when the enemy is on the verge of collapse, the regular troops from outside the area of conflict might start pouring in as volunteers. In this case they might be equipped with more modern weapons. The type of interdiction which has so far been described is a short term one, the plan of which will be guided by the progress of the ground battle.

Another important aspect of interdiction, which would be more pronounced in a limited war, is the long term one. Air operations would be directed against supply dumps and troop concentrations in the rear. Bridges and other key points in the communications system would be attacked. The aim would also include the denial to the enemy of the supplies moved in from outside the area, by destroying the key points in the communication system connecting the area of conflict with the outside world. In this effort, air power would act as co-partners, with the ground forces in the general aim to weaken the armed resistance of the enemy. In long term interdiction missions the best suited aircraft would be light/medium bombers with modern bombing and navigational equipment.

The momentum of the Chinese drive southwards in December, 1950, was broken and the same overwhelming force was pushed back north of the 38th Parallel, primarily because his logistics were seriously interfered with through interdiction.

TACTICAL TRANSPORT SUPPORT

The area in which a limited war is likely to be waged would have a poor communication system, thus placing a strain on the progress of ground advance. As was done in Korea, a determined enemy could frequently succeed in road block tactics resulting into serious embarrassment to the forward troops. Absence of an assured means of supply would, obviously, affect the progress of battle, and if this supply is cut off at a critical time it might even become decisive. Air supply could decidedly overcome this drawback and maintain tactical logistics at a balanced level. Air supply would also help to maintain the momentum of an advance when the ground forces press hard upon a fleeing enemy. Under these circumstances, with the limitations imposed on the surface supply system, they would easily outrun their surface logistics and be forced to halt. It would thus provide the enemy with a breather to reorganise for a firm defence or a counter-offensive.

Tactical considerations would, at times, demand that the fleeing enemy be cut off in his rear. On the other hand, specific operations in the enemy's rear might enhance a ground plan. To meet these contingencies airborne operations could be carried out with success, thus executing a vertical development of the enemy.

In any theatre of war there would be special need for use of air transport on missions, such as, communication flying, casualty evacuation, clandestine operations, etc. The tremendous effect which casualty evacuation has on the morale of the fighting troops would, in itself call for special effort to maintain a casualty air evacuation system alive.

SCOPE OF AIR POWER

From the foregoing it has been seen that the character of a limited war does not present worthwhile target systems of a strategic nature. The industries that back such wars would be outside the confines of the war area. The limited nature of operations which both sides observe in order to avoid a suicidal total war does not permit attacks on the sources of production. Consequently, the primary arm of air power, the strategic bomber, remains unemployed. The air power in such a war is essentially tactical in nature. Even the effort of the medium bombers would not be directed against the limited industrial resources, or the administration or morale of the local people within the area of conflict. It would normally be inconsistent with the political aim. In the Korean War, targets such as hydro-electric projects and dams were, in fact, attacked. But it was only during the armistice negotiations. It was calculated to achieve more favourable terms at the conference, rather than dislocating the enemy's industry or war potential.

What is, however, strategic and extremely important is the capacity of air power to transport forces thousands of miles away to the theatre of operations in quick time, and then sustain such operations at a tempo dictated by the degree of intensity of the war.

In order to meet the requirements of a limited war, the most important need would, obviously, be for high speed, long range transport aircraft, so that the combat group designated for a theatre can reach its destination before it is too late. The next, in order of importance, would be the tactical element. Its size and composition would be greatly governed by the type and intensity of enemy operations. Should there be extensive enemy air activity, then a much greater complement of fighter-bomber and medium bomber aircraft would be necessary in the fight for air superiority. In the case of transport aircraft for tactical support operations, it would be determined by the tempo of operations, state of communications system and the tactical requirements for airborne operations. The size and balance of air forces in a limited war are hardly static quantities but would vary with the nature of each war.

LIMITATIONS OF AIR POWER

Effective application of air power is conditioned by the degree of understanding one has of the limitations from which it suffers. Study of these limitations permits a more effective exploitation of air power and prevents its breakdown. Without the knowledge of shortcomings of air power, its application would prove it to be a double-edged weapon leading to fatal consequences.

TECHNOLOGICAL

Air power is the outcome of technological progress and, therefore, the instruments of air power are necessarily technical. Aircraft demand a high degree of maintenance and repair facilities which cannot be easily established. The modern jet aircraft also requires a well developed airfield to operate from. In a limited war, the area of conflict being under-developed, the necessary facilities would be absent, with the consequent restrictions on the size of air forces to be employed. However, the system of global defence would provide bases with air offensive having cross cover. But these would not be useful for short range aircraft, and if they are, the area of operations might be at their extreme range. The answer to the airfield problem will be found in the development of S.T.O.L. and V.T.O.L. aircraft.

Another limitation of serious consequence is the very high cost of modern aircraft. Therefore, there would never be enough to meet a given situation. The proper employment of the available air forces demands highly specialised knowledge and experience.

TYPE OF TERRAIN

The scope for application of air power would depend on the type of terrain. In a thickly forested area it would be seriously hampered. There will be scope, no doubt, but it would be greatly diminished. A mountainous country with steep gorges, would similarly restrict operations. The greater speeds of jet aircraft would make identifications of targets difficult and set in problems in attack conditions.

INFLEXIBILITY

The greatest asset of air power is its flexibility. But this flexibility ends at the limits of aircraft range. Beyond these limits air power is most inflexible. It could be overcome by providing airfields close to the battlefield but airfields are difficult to build and the ground organisation required at each of them is complicated. However, the increasing range of the modern ground attack aircraft and the restricted sphere of operations would minimise this limitation.

UNSUITABLE AND ELUSIVE TARGETS

In a limited war, the enemy being necessarily lightly equipped, and depending on his offensive primarily on manpower, the targets that can profitably be engaged from the air would be limited. What an infantryman could destroy effectively, an aircraft might find both expensive and difficult to accomplish. On the other hand, the enemy could, and normally would camouflage his light forces more effectively, thus presenting elusive targets. This limitation on air power would be more marked in guerilla warfare.

WEATHER

Modern air power has very nearly met the challenge of weather through electronic technology. Aircraft has become all-weather and can take off,

navigate, blind bomb a target and land in zero visibility. However, this ascendancy of air power is essentially in the sphere of strategic role—its primary role. Airfields adequately equipped with navigational aids, aircraft with suitable electronic devices and targets large and static in nature, are the main features which permit air power to function on an all-weather basis. In the case of a limited war, airfields would be ill-equipped with aids. Moreover, most targets would be non-static so that visual identification would be necessary. Therefore, the tactical nature of air support would reduce considerably the effectiveness of air power in adverse weather conditions. Air activity in general, and tactical air supply and close support in particular, would be affected by weather. And herein lies the most serious drawback of air power. If the ground forces have geared their firepower and logistics to support by the air forces, the sudden absence of this air support might easily lead to serious weakening of land operations. And when it is considered in the light that weather is an unpredictable factor, the limitation that it imposes on air power may well be considered the predominant one.

CONCLUSION

In the climate where both communists and the Western Powers possess nuclear forces, the emphasis has shifted from general war to limited war with limited objectives. These great powers contest each other by proxy giving limited and varying support in arms and supplies to the opposing minor states or political bodies in conflict, but stopping short of deliberate acts which might precipitate total war. However, the greater trend for aggression appears to be with the Communist bloc, with the aim of ideological world domination through fair or foul means. The aggression for such expansion would normally be directed in most inconspicuous and under-developed regions. To counter such strategy the other camp would require a strategic strike contingent, capable of a rapid reaction to use a measured force where and when required. The ability to react rapidly is the most important single requirement in effectively meeting the threat. Apart from military advantages of rapid concentration, the political advantages might be crucial in determining whether in fact a war can be kept limited, or even whether or not it can be precipitated.

Under these circumstances the force that could effectively meet the challenge would, by necessity, be small and lightly equipped but possessing strategic mobility. It would have its strike power substantially supplemented by air power, to make up the lack in ground organic support fire.

Air power would be strategically employed in providing strategic mobility to the strike force and maintaining an adequate logistic support during its operations, and particularly in the initial stages when the sea/land communications would be non-existent. In addition, air power would be extensively used in the tactical support role. The immediate demand would be for air supremacy, while the next important task would be that of reconnaissance, close support and interdiction. Depending on the circumstances, air supply, air-borne operations and support for combined operations would be undertaken most profitably.

Air power with its characteristics of flexibility and mobility have made possible the fighting of limited wars with confidence. Without air power the free world might have had the unhappy experience of watching aggression

succeed while the alternative in the nature of a total war was too suicidal to contemplate. The value of air power in a limited war could well be assessed from the summary of its employment in the Korean War. Here at the outset, the firepower released from the air, weakened and then disabled the N.K.P.A. advance, until the U.N. ground forces could be consolidated at the Pusan perimeter. Then by an interdiction campaign the airforces opened the way for the ground breakout from Pusan and spearheaded the mop-up of the N.K.P.A. When the Chinese entered the war with overwhelming strength, their drive was arrested by the air attacks, which were delivered with great vigour.

The potentialities of air power in a limited war are great indeed. But air power can be exploited only when its limitations are understood. And of these the weather factor is the most predominant.

SOLDIER SCIENTISTS

Maj. HARBANS LAL

APPPLICATION of scientific knowledge to warfare has been known since before the Christian Era. Archimedes is known to have devised a revolutionary weapon in the form of a colossal catapult to outrange the adversaries of his motherland. Numerous other examples are quoted in literature, the most spectacular and fantastic being the application of Prof. Einstein's theory of relativity in the design of atomic weapons, the first of which destroyed the Japanese city of Hiroshima and the second the city of Nagasaki.

The application of scientific knowledge, methods and techniques to the solution of problems of warfare during World War II was on a gigantic scale. Large bodies of scientists were employed in experimentation with weapons of war, techniques of warfare, military, naval and air doctrines, manpower and its training, utilisation of limited resources of the nation, balancing the conflicting requirements of the various departments of governmental activity and the like. Not that the correct solution was always found, but the magnitude of the contribution of scientists was phenomenal. The pace of scientific research and discovery was accelerated and new sub-branches of science have since been organised. Military colleges and institutes have come into being to derive full advantage from advancing science and technology in the field of national defence—the Military College of Science in U.K. and the Institute of Armament Studies in India being examples.

No country can ignore science and its application to the techniques of attack and defence. A glaring example is the race between the Western Powers and the USSR who are both announcing development of weapons and techniques of war *deadlier* than any existing. The world is fast approaching push-button warfare in which the contribution of the scientist or technologist will be tremendous and most nations, especially the technologically under-developed ones, will feel shortage of the appropriate type of personnel for scientific or technological effort involved.

The question of personnel is many-sided—it embraces their basic knowledge, their suitability for the study of military problems, facilities for acquiring such knowledge in the country, educational system (including military institutions), demand by industry and other spheres of national life, and so on. In this article it is intended to discuss the type of scientist suited to jobs in the armed forces. Such personnel I call "Soldier Scientist".

It is important first to understand the types of problems that face the soldier in his profession. These will give a clue to the type of soldier suited to the job. These problems may be divided into the following inter-dependent but broad categories, i.e., those concerning:

- (a) weapons
- (b) personnel, and
- (c) doctrines of warfare.

WEAPONS

Weapons of war in the contemporary set-up are either conventional or revolutionary. Those that were revolutionary some time ago are conventional

today, and such transformation continues all the time. Armed forces in contemporary societies have to depend on conventional weapons as change-over to revolutionary types in peace gives away secrecy and imposes financial burdens which most nations can ill afford. The efficiency of the weapon and its use, however, lend themselves to improvement. To effect this requires a knowledge of the weapon, its use, capabilities of the present organisation, and a mental bent for experimentation. The scientist for this job should, therefore, be essentially a regimental soldier dedicated to soldiering. There is no need to raise his scientific and technological abilities to those of Ph.D.s D.Sc.s and B.Sc.s; nor does he require a laboratory for his work. He should observe the weapons and equipment in training, in exercises and in actual use, and make suggestions for their improvement to other scientists who should essentially be technologists and can understand the soldier's language as well. The place of this group is in laboratories and technological institutions.

The case of revolutionary weapons is different. They will be radically different from the ones in use. Their conception stems from some innocent-looking scientific discovery. Examples are gun-powder and splitting of atom. The job may be left primarily to the scientists in the laboratory who should keep in touch with advancing science and basic research. There is no bar to a very useful idea on a revolutionary weapon occurring to a soldier, but Brig. L. S. Anand's remarks on the point in his article "Birth of a Weapon" are illuminating and it would be necessary to charge scientists of high calibre with the task of thinking of revolutionary weapons for the armed forces in any country.

Weapon drills and usage normally offer a fruitful avenue of study. Under any set of circumstances there will be a "best method" of utilising a weapon. This, however, is not easy to find and may become considerably inferior with only a slight change in one of the circumstances. This again is a matter for study by the regimental soldier with a scientific bias.

Advancing technology offers ways and means of improving all conventional weapons, e.g., a new alloy may reduce the weight of existing weapons. This, however, is a job for the technologist who should keep all existing weapons and equipment under review with a view to making them lighter, more easy to handle and efficient, less cumbersome, more robust and easy to maintain.

PERSONNEL

Personnel problems are increasing in both volume and complexity. Changing equipment further aggravates this. The selection of personnel, their suitability for various trades of services, training, administration, management, morale, possible behaviour under certain sets of conditions, creation of balanced organisations, all lend themselves to scientific examination. They essentially require knowledge of psychology, biological statistics and laws of variability, a general knowledge of theory of statistics and social sciences, together with some knowledge of the type of tasks expected to be performed by the personnel. Similar study in industry is in fact extensively employed.

For this, close collaboration between experts in psychology and statistics and the social scientist and the soldier, is essential. The job is essentially of the experts who should get to know the soldiering side alongside their study.

In India the problem of "man management" is fast changing complexion due to changes in the social and economic structure of society. The well-

tried methods of old, though they may be found sound in principle, are failing in practice. The professional leader, if continued to be trained in the traditional way, will not be able to cope with present-day situations. It is in fact happening that the young officer is obliged drastically to change his ideas on first joining his unit. There is currently an emphasis on change, and tradition will be retained only if it does not interfere with progress. The problem, however, is so complex that a slight change may upset the balance of the structure and cause serious weakening if not collapse. The best brains will, therefore, have to think of these problems from all aspects and find solutions.

SERVICE DOCTRINES

This is a field in which scientific investigation paid very handsome dividends during World War II. The classic example is the Allied Anti-Submarine Campaign in the Atlantic. Statistical analysis of the relevant data pointed to a particular mode of utilisation of the available anti-submarine resources to achieve maximum "kills". When adopted it did achieve far more satisfactory results than the mode of action it replaced.

There is always a balance under a given set of conditions. This balance is being constantly disturbed because the relevant factors are not static but change due to development of weapons, doctrines, enemy's potentialities and a host of other factors. The doctrines should, therefore, keep pace with these changes. It would naturally involve a knowledge and study of relevant circumstances to collect data for analysis and, again, close collaboration and understanding between soldier and scientist.

Having considered the type of services problems, we may now deduce from it

- (a) the type of personnel required to solve them;
- (b) their qualifications and training;
- (c) where they should be stationed; and
- (d) what work should be entrusted to them.

The total scientific effort in the defence forces of a country may be grouped into three echelons or levels as described further. These echelons will be manned by similar categories of personnel and handle similar problems.

REGIMENTAL ECHELON

The first is the Regimental Echelon or the scientific effort necessary at regimental level. A regiment or equivalent is the basis of all organisation in defence forces the world over, and its efficiency determines the overall efficiency of the fighting machine. The problems at this level should be tackled properly and by scientific methods or techniques.

The problems may be primarily of improvements in existing weapons, their usage, drills, tactics at regimental level, organisation, man-management and the like. The other two echelons may refer certain specific questions to the regimental echelon for limited experimentation or consideration to fit into wider, overall scientific effort.

The personnel at this level must all be regimental soldiers with know-

ledge of scientific techniques of experimentation. The work will be essentially practical and theoreticians will not be much suited. The spirit of considering all problems scientifically may be infused from the day a regimental officer starts his training as a cadet. The nature of such experimentation, however, is somewhat complex and special training will be necessary to develop the essential dynamic and pragmatic outlook.

Such personnel should be posted to the regiments as normal regimental officers. Some may prove useful in the training establishment centres and schools as well. Their usefulness will diminish if they cease to be regimental officers.

TECHNOLOGICAL ECHELON

The next echelon, not necessarily a higher one, is the technological echelon. This will be concerned mainly with the study of equipment in respect of their design, development, inspection, production and maintenance. All these functions are inter-dependent and must be studied together. The brightest idea emanating will be of no use unless it materializes as a tool of war in the hands of troops. The other two echelons will have to feed the technologists with ideas to be transformed into concrete shape.

Personnel for this echelon will, of necessity, be technologists, persons who know industry, industrial capacities, industrial materials, their fabrication into goods, techniques of manufacture, and the like. They will need help from the regimental echelon in translating the 'bright idea' into performance or technical data for the manufacture of new equipment, and once it is made, to try out the prototypes.

Personnel for this echelon would need a certain continuity in their job. Frequent changes will not be conducive to efficiency. Also, technologists are not made in universities but are created only by experience.

SCIENTISTS ECHELON

The need for the "Scientists Echelon" lies in the need for keeping the techniques and tools of war abreast of advancing science. The new theories and discoveries and scientific interpretations should be continually reviewed with a view to their application to the problems of the soldier. Any technique that has the potentialities of application to any sphere of activities of the armed forces will have to be considered and either discarded or accepted for further experimentation. The latter may be done with the active co-operation of the other two echelons, but the scientist will have to state his theme in a language understandable to the regimental and technological echelons.

This echelon will indeed have to develop into a "Brains Trust" for the armed forces. Extensive literature will be made available, categorised and indexed. Close liaison will have to be maintained with the rest of the scientific world and presumably research undertaken on reciprocal basis.

Such personnel should rather not be soldiers, but ex-soldiers with some experience of defence forces who would be quite useful in understanding the broad requirements. Only an understanding of soldiering in its widest sense and of future tasks is necessary for this purpose.

CO-ORDINATION

The three echelons of scientific effort, though quite distinct from one another in theory, will overlap and merge in practice. Very close co-operation, co-ordination and liaison will, therefore, have to exist to achieve the best results and each will have to help in solving problems facing the others.

A difficult problem will be the inter-echelon flow of information, its proper co-ordination and utilisation. The scientists will often require the technologist to give his ideas practical shape and then get the regimental echelon to try them out.

Good co-operation and inter-echelon flow of information can be achieved by placing all the three under one head. This will, however, have a tendency to eclipse the regimental echelon and turn it into a technological one. This has to be avoided even if the regimental echelon has to be put under dual control. The personnel in regimental echelon must not cease to be soldiers. Between themselves they must build a storehouse of all knowledge concerning tools and techniques of war.

In the present organisation only two echelons and those too organised haphazardly would appear to exist, i.e., technological and scientists. The regimental is conspicuous by its absence and instead efforts are made to make technologists out of soldiers. This is of doubtful utility, especially when civilian technologists of experience have delivered the goods at least in other countries. The soldier technologists, when experienced, are only technologists and hardly soldiers at all. An effort on their part to maintain touch with soldiering often interferes with their technical responsibilities. The difficulties of continuity, so essential in the technological echelon, is less easy to maintain with soldiers than with civilians.

The scientists echelon, though started about 1945, is still claimed to be in the formative period. When properly set it should be capable of propounding useful themes. Scientific research, they say, "is not always productive and a long process which justifies itself for its own sake." This, however, is not always acceptable to the soldier, who may well become impatient.

There would appear to be an acute necessity for starting the regimental echelon, with functions as discussed above. They should ponder over the why and how of all tasks facing the soldier, raise doubts and question the technologist and the scientist. At present very few queries are forthcoming from this direction. These queries will stimulate thinking and ultimately bring about more efficient tools and techniques of war.

The organisation visualised for regimental echelon cannot be discussed here in detail, but in broad outline it should start with a small staff in the equipments directorate under the general staff and have field workers at the regimental level, without any intermediary links.

India, as a new nation in the field of modern organisation for war, is at present setting up machinery to tackle defence problems scientifically. It is important to lay soundly the foundation of the three echelons of scientific effort at "regimental", technological and "scientists" levels. Personnel will have to be trained appropriately, provided with tools of facilities for the jobs

and formed into or attached to appropriate units. With some experience and passage of time they should ensure that

- (a) the best methods of performing soldier's tasks in peace and war are evolved by experimentation with techniques or procedures and tools of war;
- (b) available tools of war are constantly reviewed with a view to producing effective small, light-weight and simple equipment employing the latest advances in technology and materials; and
- (c) all new scientific discoveries and existing knowledge are made use of to revolutionise the tools and techniques of warfare.

THE INTERNATIONAL SCENE

By MAHENDRA KUMAR

THE year 1961 was dominated by a number of significant developments which affected international relations in many ways. Some of them were for the better and some for the worse. The year marked the addition of two more African countries—Sierra Leone and Tanganyika—and one country in the West Pacific—West Samoa—to the comity of independent nations. This was greatly welcomed by all freedom-loving people as a reassurance of their faith that colonialism will be liquidated before long. On the cold war front the picture was rather gloomy. It was expected that the inauguration of the Democratic Administration of President Kennedy in the United States in the beginning of the year will bring some relaxation in the cold war situation. But this is far from the case. One may not, however, easily pinpoint which side is to be blamed. But the resumption of nuclear tests towards the end of the year first by the Soviet Union and then by the United States as well as the rearmament programme on both sides are certainly indications of the growing mistrust between the two power blocs.

Another significant feature of the year under review was a clear projection of the Sino-Soviet rift at the Twenty-second Congress of the Soviet Communist Party leading Albania to fall in line openly with China.

The Congo and the Laos crises further deteriorated during the course of the year. The former led to the death of Hammarskjöld and presented an ever-more serious challenge to the United Nations and the latter resulted in greater foreign intervention.

The year may be called a year of international conferences which concerned all aspects and all regions of international life. There was the Commonwealth Conference, the ECAFE Conference, the Monrovia Conference, the Casablanca Conference, the Neutral Nations' Belgrade Conference and a number of other smaller international conference.

The year under review will also be remembered for mankind's marvellous achievement in the field of successful manned space flight, although it is an awesome landmark from the point of view of those who prefer peace to progress in the astronautical field. All this is very good as far as it is used as an instrument for the creation of a brave, new world rid of hunger and disease. But those whose memory of Hiroshima and Nagasaki is still fresh can hardly be convinced that the Soviet-American competition in outer space is not a part of the arms race programme.

LIBERATION OF GOA, DIU AND DAMAN

At midnight on December 17, Indian troops crossed into Goa to protect Goans from further Portuguese repression and tyranny. This decisive step was taken to wipe out the last vestige of colonialism on Indian soil. The Army and Air Force began operations in a three-pronged attack after all efforts of the Government of India to settle the Goa issue peacefully during the last fourteen years had been rejected and spurned by Portugal. The Indian forces also marched into Diu and Daman, the other two colonial pockets in the Indian sub-continent. The mission of liberating the three territories was accomplished finally in the early hours of December 19 when the Portuguese forces sur-

rendered at Panjim, the capital of Goa. The surrender was accepted by Lieut-General Chaudhuri. Later, the Indian flag was hoisted at Panjim, Maj.-Gen. K. P. Candeth who was in charge of military operations in Goa took over as Military Governor of Goa on December 19.

In response to Portugal's complaint against India's action in Goa, the UN Security Council held an emergency meeting on December 19 in which a resolution jointly sponsored by the United States, Great Britain, Turkey, and France was presented calling for an immediate cease-fire and the withdrawal by India of her forces from Goa, Diu and Daman. The resolution failed to be adopted because the Soviet Union exercised its veto against it. After the failure of this resolution, another resolution was moved by Ceylon, Liberia and the United Arab Republic calling upon Portugal to "terminate the hostile action and cooperate with India in the liquidation of her colonial possessions in India". This resolution too was lost by four votes in favour to seven against. In the meeting of the Security Council the American representative, Mr. Adlai Stevenson, spoke condemning India's action in liberating Goa and other Portuguese possessions in India. He even went to the extent of "predicting" that the action had potentially "shaken the foundations of the United Nations."

While India's action has been welcomed by those who are convinced that colonialism is the worst evil in international life, some people have criticized India on the score that she has abandoned her policy of peaceful settlement of disputes. For fourteen years India made all efforts for a peaceful solution of the Goa issue but every effort made by her in this direction convinced her more than before that Portugal would never be willing to leave her colonial possessions in India. Therefore, it was imperative on the part of the Government of India to take positive steps to protect Goans from Portuguese repression. Even in such a situation India agreed to U Thant's proposal for negotiations between her and Portugal. But the intransigent attitude of the latter compelled India to take the step she did.

CONGO

The Congo crisis during the quarter continued as before taking new turns almost every day. The deadlock between the UN officials and delegates of secessionist Katanga also continued over the question of white Belgian officials in the province. On October 14 a Katanga-UN cease-fire agreement was announced which was criticized by Premier Adoula of the Congolese Central Government. Its ratification was also opposed by the African members of the 18-nation UN Advisory Committee on the Congo on the ground that this would mean the recognition of secessionist Katanga. On October 25 the UN withdrew its troops from all positions in Katanga. On October 30 it was reported that Premier Adoula had sent forces to end Katanga's secession. The same day it was also learnt that Katanga planes had bombed villages and railroad lines along the Kasi-Katanga border in violation of the cease-fire.

In response to this situation the UN started giving full support to the Congolese Central Government in destroying the Katangese offensive activities. Thereupon, Mobutu's forces penetrated deep into Katanga. But later, Katanga para-commandos repulsed the Central Government's advancing forces. During the middle of November the situation took a serious turn when mutinous Congolese troops shot dead 13 Italian airmen of the UN Force at Kindu. As a result of this, all airfields around the Kindu area were closed. By December 6 the situation deteriorated so much that the UN Forces had to strafe the Katanga air base at Kolwezi, 200 miles north-west of Elizabethville.

This resulted in some of the Belgians leaving Katanga. One significant development that took place during the second week of December was that Tshombe lost control over his troops. On December 16 Tshombe fled his capital of Elizabethville as UN troops battled their way through Katangese defences. The situation showed some sign of improvement when Tshombe signed an agreement with Adoula for ending the secession of Katanga and bringing it under the fundamental law of the Congo. But later, Tshombe himself denied that any such agreement had been reached. Thus the Congo problem is still without any prospect of any early solution.

LAOS

In the first week of October the Laotian tangle showed some sign of resolution when the right-wing Premier Prince Boun Oum, neutralist Prince Souvanna Phouma, and pro-communist Prince Souphannouvong met to discuss a coalition government for Laos. On October 8, Prince Souvanna Phouma announced that he had been chosen Premier of a new provisional government for Laos.

But when on October 18, King Savang Vatthana asked Prince Souvanna Phouma to form a coalition government the left-wing Pathet Lao leader, Souphannouvong, laid down a new condition for his party's participation in the coalition, that is, that each party in the coalition should have the right to choose its own representatives to serve in the cabinet. Therefore, negotiations again started and continued for weeks together. Meanwhile, it was reported on November 2 that 100 communist guerillas had been killed by Government paratroopers in a fierce battle near Saigon. Major skirmishes in southern Laos also started between Government and Pathet Lao forces.

On December 4 an important step was taken in the history of the Laotian crisis when the 14-Power Laos conference reached an agreement on six major aspects of Laotian neutrality. According to this agreement, the powers of the co-chairmen were reduced and the responsibility increased. It also demanded the withdrawal of all foreign troops from Laos.

On December 15, the three Princes, Boun Oum, Souvanna Phouma and Souphannouvong, agreed that the proposed coalition government for Laos should have sixteen ministers. Three days later, the 14-Power Geneva Conference on Laos adopted a declaration on Laotian neutrality. This itself is an important development because it has at least brought an agreement among the world powers on the need for guaranteeing Laotian neutrality. The three Princes were urged to meet and work out plans for an early formation of a coalition government for Laos.

TWENTY-SECOND CONGRESS OF THE SOVIET COMMUNIST PARTY

The Twenty-second Congress of the Communist Party of the Soviet Union was held in Moscow in the latter half of October. Nearly five thousand delegates attended it. Besides adopting the Party programme, the Congress was faced with controversies on three issues of major significance—the 'Stalin personality cult', the 'anti-Party group', and the position of Albania within the Communist Bloc. It is common knowledge that in 1956 the Central Committee of the CPSU presented a united front to embark upon a programme of decentralization. It was apparent from the very beginning that there had been opposition to this decision. Chief among those who opposed it are now said to be Molotov, Kaganovich, Malenkov, Voroshilov, Bulgarian

Saburov, Pervukhov and Shepilov. In the 22nd Congress Khrushchev and his supporters charged these men of the 'anti-Party group' with personal responsibility for torture and with signing and approving death warrants of innocent people during Stalin's regime.

In the Conference, Khrushchev also opened an attack on the Albanian Communist leaders, although the Albanians were not invited to the Congress. Khrushchev asserted that the leaders of the Albanian Communist Party had not properly understood the de-Stalinization policy adopted in 1956 and their opposition to it had worsened the relations between Albania and the Soviet Union. Chou En-lai neither condemned nor excused the Albanians; instead, he stressed the need for consolidating the unity of Communist parties everywhere. This attempt of his to refrain Khrushchev from further attacks on Albania was almost wholly infructuous. The Soviet speakers linked the Albanians to the anti-Party group in terms of their common opposition to de-Stalinization.

There were differences between the Soviet Union and Communist China also, particularly on the question of the inevitability of war. The 22nd Congress projected sharp differences between the two groups of the Communist Powers of the world.

NEW UN SECRETARY-GENERAL

On November 3, U Thant, Burmese permanent representative at the United Nations, was elected Acting Secretary-General of the UN in succession to the late Dr. Dag Hammarskjöld. U Thant was recommended for the position unanimously by the Security Council and the recommendation was accepted unanimously by the General Assembly. It was provided that U Thant would act as Secretary-General for the unexpired part of the late Dag Hammarskjöld's second five-year term which expires on April 10, 1963. The election of U Thant was preceded by six weeks of private negotiations including many discussions between Adlai Stevenson of the United States and Zorin of the Soviet Union. The resolution for U Thant's election was presented in the Security Council by Ceylon, Liberia, and the U.A.R. His election was greatly welcomed by all sections of world public opinion particularly because ever since the death of Hammarskjöld there had been differences between the Soviet bloc and the Western bloc over the question of a mutually acceptable successor to Dag Hammarskjöld.

Born at Pantanaw (Burma) in 1909, U Thant got his education first in a local high school and then at the University of Rangoon. He is a Buddhist. He entered political life after the second world war as a member of the Anti-Fascist People's Freedom League which is the ruling party in Burma. Thereafter, by his ability and non-partisan approach to national problems, he held a number of appointments of responsibility. In 1957 he was appointed Burmese permanent representative at the United Nations with ambassadorial rank, an office which he held continuously upto the time of taking over as acting U.N. Secretary-General. He has also served as a vice-President of the General Assembly and as chairman of U.N. Congo Conciliation Committee. U Thant is also an author of several books.

GENERAL ELECTIONS IN SOUTH AFRICA

On October 13, general elections were held in South Africa. It was the first general election to be held since the proclamation of South Africa as a

Republic. The result was the return of Nationalists with an increased majority both in votes and seats. On the opposition side the elections were contested by the United Party, the Progressive Party, Conservative Workers' Party, Liberal Party, and Independent candidates. In all, the Nationalist Party secured 105 seats, the United Party 49 seats, and the National Union and Progressive Party one seat each. The Prime Minister, Dr. Verwoerd, was returned unopposed. Seven others of his cabinet were also returned unopposed. After the elections, Dr. Verwoerd made a broadcast on October 20 in which he reaffirmed his Government's determination to continue its existing policies.

TANGANYIKA

On the midnight of December 8-9, Tanganyika became an independent member of the British Commonwealth, thus ending 42 years of British trusteeship over Tanganyika. Mr. Julius Nyerere is the Prime Minister of independent Tanganyika. His Government's internal and external policies were outlined in the speech from the Throne, read by the Duke of Edinburgh on December 11 at the opening of the National Assembly's first post-independence session in Dar-es-Salaam. In internal matters, the Tanganyikan Government pledged itself to the promotion of the three-year development plan, the conversion of the old fashioned native authority into modern and effective local authority, improvement in educational facilities, and Africanization of civil services. The external policy was set out to respect the United Nations Charter, to seek brotherly cooperation with other African States, and to develop Tanganyika's links with the British Commonwealth. Mr. Nyerere described his country's domestic policy as "war on poverty, ignorance and disease," and the external policy as "a middle course" between the world power blocs.

Within less than a week of attainment of independence, on December 14, Tanganyika became the 104th member of the United Nations. Her application for membership was sponsored by Great Britain and was unanimously approved by the Security Council and the General Assembly.

ECUADOR

On November 8, the Ecuador President Velasco Ibarra, was overthrown after a prolonged political crisis including an open clash between the Army and the Air Force. He was succeeded by Dr. Carlos Julio Arosemena who was hitherto Vice-President of the Ecuador Republic. The conflict between Ibarra and Arosemena began in July 1961 over the issue of the latter's advocacy of Ecuador's establishing closer relations with communist countries. On October 17, Ibarra charged Arosemena with working against the regime. Latter, Arosemena as President of the Senate, announced that impeachment proceedings would be instituted against Ibarra and also charged him with organising an anti-Government coalition. President Ibarra resigned after a day of confused fighting in Quito and took refuge in the Mexican Embassy which he was allowed to leave to go into exile in Argentina. He reached Buenos Aires on November 12. This is Ibarra's third exile, the first two being in 1934 and 1947. Arosemena was sworn in as President with the support of the armed forces. In his inaugural address to the Congress he declared that his country would establish closer links with communist countries and with Cuba. Arosemena is a member of one of the wealthiest and socially prominent families of Ecuador. His father and grandfather both have been Presidents of the Ecuador Republic. A doctor of law of the University of Quito, Arosemena has held several diplo-

matic assignments. After taking over as President he formed a broad-based coalition government which includes four Liberals, two Socialists, one Conservative, one Social Christian and one Liberal Independent. Strangely enough, it has no representative of the Eucadorean Communist Party.

LEBANON

Following the resignation of Saeb Salam's Government on October 24, Rashid Karami, took over as the Prime Minister of Lebanon. The fall of Salam's cabinet was caused by a growing dissatisfaction among certain groups and a personal dispute between Salam and his cabinet colleague, M. Jumblatt, over a departmental appointment. This gave strength to the opposition under Karami and it was feared that he had gained sufficient support to outvote the Government. Salam, therefore, resigned on October 24 without awaiting defeat in the Chamber. The membership of the new cabinet headed by Karami is 14 as against 8 in the outgoing cabinet. Karami, 40, is a Sunni Muslim. He had been Prime Minister of Lebanon in 1955-56 and in 1958-60. He was one of the leaders of the risings against President Chamoun's regime in 1958. On November 18, Karami's Government received a vote of confidence.

WEST SAMOA

On January 1, 1962 West Samoa became an independent country. During the year 1961 a number of significant steps were taken to implement the tentative plan, agreed upon by the New Zealand and West Samoan Governments and subsequently endorsed by the United Nations Trusteeship Council, for bringing Western Samoa to full independence. On the same day ended New Zealand's formal responsibility for the constitutional, social and economic progress of West Samoa entrusted to her under the United Nations Trusteeship Agreement of 1946. Independence was achieved by a series of definitely timed steps.

West Samoa consists of a group of islands in the Western Pacific north-east of Fiji. These islands are four—Savai-i, Upolu, Manono and Apotima. The total land area is about one thousand square miles and the present population is 1,10,000 of whom some 6,000 have the legal status of "Europeans." The rest are Samoans, a branch of the Polynesian race. The people are almost wholly literate and Christian. When the First World War broke out in 1914, New Zealand took West Samoa to prevent it from being used as a raider base. From 1921, West Samoa was governed by New Zealand under the mandate system of the League of Nations. In 1946, it became New Zealand's Trust Territory under the United Nations. In 1947, after the visit of a United Nations Mission, the New Zealand Government declared that eventual self-government was the aim of its policy in West Samoa. A Legislative Assembly was established in 1948, although with a restricted franchise. During 1948-58 several steps were taken to introduce gradually the parliamentary system of government in West Samoa. In 1959, the UN Trusteeship Council appointed a four-man Commission headed by Arthur Lall of India to make an accurate assessment of the conditions obtaining in West Samoa and for suggestions about the termination of trusteeship over it. In October 1960 a new Constitution for the independent State of West Samoa was adopted which came into force on January 1, 1962.

The independence of West Samoa is a landmark in the history of the liquidation of colonialism. Few colonies have attained independence as peace-

fully as West Samoa. The credit for this certainly goes to New Zealand whose policy in West Samoa ever since 1946 has been to help create conditions leading West Samoa to her full independence. That is why there is no bitterness or ill-will between the two countries. Even after independence West Samoa has expressed a wish to enter into a Treaty of Friendship with New Zealand so that New Zealand's help, administrative as well as technical, may continue to be available. The New Zealand Government is also ready to continue its various schemes for the well-being of Samoans.

SCIENTIFIC EXPEDITIONS AROUND THE WORLD 1760-1850*

By A. BERIOT

THERE has been a lot of general stories on explorations which have been written and also some particular studies have been made on some of the most important of those explorers.

My work has been to put together all the documents and books concerning this specific period of voyages going from the middle of the eighteen century until the end of the sailing boats. For several years I have looked for the original drawings made by the artists who belonged to those expeditions, manuscripts, etc.

Some of the original drawings were used for the engravings which have illustrated the official narratives of those voyages. Looking at those original works it has been interesting to find out that a certain number had been changed by the engravers and were not exactly the reproduction of the original drawings. I have also found a great number of drawings, maps, etc., which have never been published until now.

You will see in looking at those old paintings the influence of the European Schools on those painters, how they have seen and presented Pacific.

Parkinson, the artist who accompanied Cook on his first voyage hesitated between his artist's interpretation and his desire of documentary precision. Hodges, the painter on Cook's second voyage was more anxious about the needs of Science as well as Webber, the painter on the third voyage who showed great ability in describing the exotic landscapes. But the natives are still seen as "Noble Savages" and we are far from a complete objectivity.

Missionaries have also influenced the views of the Artists. The "Noble Savage" becomes a degraded and ferocious person, without knowledge of God and this changes considerably their outlook on the natives. But little by little the scientific description improved: Wilkes' and Dumong d'Urville's expeditions confirm unity between objective painting and art and descriptions become more realistic even if the artists did not escape completely the stereotyped human types of the time.

At the beginning of modern times Portugues and Spanish explorers discovered new lands. Portugal's position facing the sea made her take the initiative in these discoveries at the end of the 15th century. Henry, the navigator, the son of King John I, played an important role in these early discoveries. The first voyage of Christopher Columbus marked the entrance of Spain in the contest.

In 1519 the Portuguese Maguellan discovered the passage to the South of America which bears his name. On 28th Novemeber 1520 he entered the great Ocean which he named Pacific and made the first voyage around the world. After Mendana, Quirroz and Torres who made such important discoveries in the Pacific, the power of Portugal declined and the Dutch, the English and the French began to cross the seas. Dutch expeditions were

* Lecture delivered under the auspices of the U.S.I., New Delhi.

mainly commercial. Fearing to lose their precious cargoes they took the safe direct route towards the East Indies.

However, the Dutch Tasman after the discoveries of Lemaire and Nuitz reached van Dieman's land, and found New Zealand. The English began to turn their eyes towards "Terra Australis".

At the end of the 17th Century and the beginning of the 18th there was no longer a rush towards the new territories. Australia and many other lands were still full of mystery. However, in the 2nd half of the 18th century a new era of explorations began. The expeditions were then sent by the Governments with scientific crews. These included Hydrographers, astronomers, zoologists, botanists and painters. The influence of certain scientists and their faith in progress awoke the curiosity of the people. The discovery of a certain type of chronometer by Berthoud in 1753 which made the calculation of longitude possible was one of the main reasons for this new awakening.

Navigators had more precise maps and instruments. The Governments who organised the expeditions gave them exact instructions. Sailing boats began to be constructed scientifically. They became larger and stronger. The wooden hulls were overlaid with copper. The ship designers abandoned elaborate poops with carving and gilding. They sacrificed decoration for simplicity and strength. The conditions improved on new ships. Scurvy was still a big problem and Captain Cook was one of the first commanders to prevent this by giving his sailors a strict regime. The problem of drinking water was also vital.

At the conclusion of the seven year war between France and England and as a result of the treaty of Paris in 1763, the ships were available and scientific crews were formed and ready to achieve the conquest of the world.

This new era of scientific explorations began on July 3, 1764 with the departure of Commodore Byron, sent by King George the Third, to discover new lands.

After a short stop at the Island of Cap Verde, they reached Brazil. Only after the departure from Rio, Byron announced to his sailors that they were going to make a trip round the world. In the Falkland Islands Byron met the French navigator Bougainville. Then he crossed the Straits of Magellan. He discovered a few islands in the Touamoutou Group: the Duke of York Island, King George Island, Disappointment Island and Byron Island (Nukunau) in the Gilbert Group. Tinian Island in the Mariannes Islands was a good place to rest the crew after such a long navigation. In November 1765 they landed in Batavia (Djakarta) and they were back in England on May 22, 1766.

The results of the campaign were only nautical. The Admiralty was not completely satisfied and as soon as Byron was back two new ships were sent around the world with Captain Wallis and Carteret. The "Swallow", Carteret's ship, was very old and could not follow the "Dolphin". In the Straits of Magellan they were separated and never joined. Wallis began to look for new lands. After new discoveries in the Touamoutou islands a new land was seen on June 19, 1766. At daylight a great number of canoes surrounded the "Dolphin". Wallis had just rediscovered Tahiti. The natives began to attack the English with enormous stones. They were obliged to use their canons. But peace could be made and Ohera, the queen of the island invited Wallis into her home. Wallis named several other islands: Charles Saunders

Island, Lord How Island (Hopiha in Society Island) Scilly Island, Boscawen (Tapahi in the Tonga Islands).

Carteret, in spite of the bad conditions of his ship had also crossed the Pacific and discovered new lands: Egmont Island, Queen Charlottee Island (Santa Cruz Island), Saint George Canal, New Hanovra in Bismarck Archipelago.

Four months were necessary to repair the ship in Batavia.

On February 19, 1769 not far from England Carteret met a French boat "la Boudeuse". It was Bougainville coming back from his trip around the world.

Louis Antoine de Bougainville was a brilliant French mathematician. As officer, he had played an important role in the Canada campaign. Very disappointed by our defeat, he decided to found a new colony in the Falkland Islands and he got the authorization from the Minister of Navy, the Duke of Choiseul, to this effect.

A colony settled over there but England and Spain claimed these islands. They were given to Spain as a part of their possession in South America and Bougainville having armed two new ships to give them back to Spain, decided to cross the Pacific. He also made some discoveries in the Touamoutou Group, visited Tahiti, the Samoa Archipelago and after calling at Batavia, Bourou Island, Cape Town, he was back in Saint Malo on March 16, 1769.

CAPTAIN COOK

While Bourgainville was defending our position in Quebec, on the other side a young sailor was sounding the Saint Laurence. His name was James Cook. He was born in a poor family but at thirteen had left his village to become a cabin-boy in Withy Harbour.

During his long voyages he studied mathematics, geography and astronomy. The results were unexpected. In April 1763 he became the Geographical Engineer of the Governor of Newfoundland.

In 1768 the Royal Society in London decided to send some scientists to observe the eclipse of Venus over the Sun announced for 1769. Cook became the chief of the expedition and commander of the "Endeavour". He took with him a rich Scientist, Joseph Banks, specialised in Natural History, and astronomist, Charles Green and two painters Buchan and Sydney Parkinson.

The Endeavour left Plymouth on the 13th of August 1768.

Having accomplished his astronomical mission in Tahiti Cook visited other Society Islands and then looked for the famous continent called "Terra Australis." For a long time people believed in the existence of a vast land going from the South of Cape Horn until Australia. Cook reached New Zealand in October 1768 without having made any discovery in the South. He went around New Zealand for several months, landing in a great number of bays on the East Coast and then reached Australia taking possession of it and calling "New South Wales" the part that he visited.

The Endeavour was back in England on June 10, 1770. But Cook was already prepared for a second expedition. People still believed in the exis-

tence of the famous Austral Continent. For several months Cook with the "Resolution" and the "Adventure" sailed in the Southernmost Pacific, among icebergs. But no land was in view. The navigators visited New Zealand, Tahiti, Tonga Islands and in spite of having been separated from his second ship the "Adventure", Cook returned to the South seas—with no more success; he visited Easter Island, discovered New Caledonia and a few lands near Cape Horn (Georgie Island) on his way back. In 1776 Cook was back in England where he had become very famous.

At this time he was convinced of the non-existence of an "Austral Continent" going from Cap Horn to New Zealand. Then he was asked to leave his country another time to look for a passage between the Pacific and the Atlantic in the North Seas.

You know that after having visited the North West Coast of America to look for this passage, Cook was back in the Hawaii Islands that he discovered, coming from the South the year before. He was killed by the natives and lieutenants Clerke and Gore returned to England with the "Resolution" and "Discovery" after a new attempt to find a passage in the North Seas.

THE HEROES OF THE PACIFIC

Jean Francois de Laperouse 1785-1788

Joseph Antoine d'Entrecasteaux 1791-1794

Malaspina and Bustamente 1789-1794

In France King Louis XVI had read about the Cook's exploits. He decided to organize a French expedition with the best scientists and he put in command Jean Francois de Laperouse, a brilliant sailor who had played an important role in the war of Independence of the United States.

Never had an exploration received so many preparatives. The best scientists and sailors had been chosen. The best instruments of the time had been given to the navigators.

Laperouse with the two ships "la Boussole" et "l'Astrolable" began to explore the North West Coast of America. Besides the scientific aims of his expedition he had been asked to take care of the fur trade. In "le Port de Francis", a new bay discovered on the North West Coast of America by the French navigators, several of them were drowned. That was the first catastrophe of the voyage. Then having crossed the Pacific Laperouse explored the Asian Coast between Japan and China. He took some rest in Saint Peter and St. Paul (Kamchatka) and went towards the South.

In the Samoa Archipelago, de Langle, commander of the ship "l'Astrolabe" was killed by the natives with several sailors. The unfortunate expedition reached Botany Bay in Australia, a few days after the arrival of Governor Philipp with the first contingent of convicts.

The last news from the expedition were dated from February 25, 1788. Then a complete silence followed for ever.

In France, in spite of the Revolution, people were anxious to know what happened to the navigators. A new expedition was sent to their research under the command of d'Entrecasteaux with two ships "la Recherche" et "l'Esperance".

They visited the Australian coast, the Admiralty Islands, etc., without having heard from Laperouse at all. D'Entrecasteaux came very near the island where Laperouse had perished in the Santa Cruz archipelago. But the weather was very bad, he was sick and he did not land on this island that he named "Ile de la Recherche". Only 30 years later did Dumont d'Urville learn the tragedy.

D'Entrecasteaux died. The expedition reached Sourabaya (Java) and was disarmed, France and Holland being at war. The results of the campaign reached France only several years later after many troubles, with the return of the sailors who had not perished in the bad climate of Indonesia.

Spain, proud of her glorious past in the story of discoveries, decided to join the European movement towards the explorations of new lands.

Two Spanish naval officers, Malaspina and Bustamente left Cadix on October 14, 1788 with the "Atrevida" and "Descubierta". Having looked for a long time for the passage between the Atlantic and the Pacific on the North West Coast of America, the expedition reached Manilla, Macao and then Port Jackson. The sailors were back in Spain in 1795 but unfortunately Malaspina was imprisoned for political reasons, just after his return in his country. The very important results of voyage were not published and a great part of the original drawings made by the artists who belonged to the expedition, are still unpublished.

EXPLORATION OF AUSTRALIA

BAUDIN 1800-1804

FLINDERS 1801-1803

1800. Bonaparte is trying to restore some order in France. Nicolas Baudin, a French naval officer is sent with "le Geographe" and "le Naturaliste" to recognise the situation in "New Holland" (Australia) and explore parts of the coasts of this country, never explored up to then.

At the same time England organized an expedition with the same aims under the command of Matthew Flinders and both contributed for a great part to the knowledge of the Australian coasts.

The role of two botanists have been specially important during those voyages. Peron for France with his companion the painter Lesueur and R. Brown for England. The collections of original paintings and vellums representing their work and still visible today are extraordinary.

RUSSIAN EXPEDITION

Until the discovery of Kamchatka, in 1696, Russia had not participated in the European commercial exchanges with China and India.

The behring expeditions permitted the discovery of the North West Coast of America and then some Russian traders organized some expeditions towards these countries to obtain furs and sell them afterwards in China. But the Government did not take part in these exchanges and a great number of these expeditions were lost at sea.

Finally a Company was founded and recognised by the Government. But the establishments in the distant colonies could not live without help and communications were very difficult. A naval officer, Krusenstern, who had been in the English Navy from 1793 to 1799, had been struck during his stay

by the importance of the trade of England with India and China. After he returned to his country he decided to improve communications between Russia and her colonies.

It was necessary to load two ships with equipment and naval shipyard engineers. He proposed the plan of an expedition to his Government and finally Alexander I accepted it.

Krusenstern with "la Nadajda" and "la Neva" went around the world from 1803 to 1805. Encouraged by the results of this first expedition, Russia organised three important new ones: two under the command of Otto von Kotzebue with "Rurick" 1815-1818 and "la Predpriate" and "la Seniavine" 1824-1826 and one under the command of Lutke with "la Seniavine" 1826-1829.

THE SAILORS AND THE SCIENCE

L.CL. de FRECINET "Uranie" 1817-1820

Louis DUPERREY "Coquille" 1822-1825

J.S.C. DUMONT D'URVILLE "Astrolable" 1826-1829

The French Government organised several important expeditions with specific aims and excellent scientific crews.

These expeditions were supposed to explore more particularly such or such group of islands and to make special astronomical, magnetic or nautical... experiences in the seas.

Dumont d'Urville on his first expedition around the world found the place where Laperouse had perished near Vanikero Island and he brought back to France many remains of one of the ships of the unfortunate navigators.

THE POLITICAL AND COMMERCIAL EXPEDITIONS

The field opened to discoveries becoming smaller and smaller, Governments organized expeditions with the task of showing the European flags in the distant countries and of protecting the trading ships and securing information on the harbours and on certain places where trade could be improved in distant countries like India, Indonesia, Cochinchina...

France organised five expeditions with these different aims:

H. de BOUGAINVILLE with "Thetis" and "l'Esperance" 1824-26.

P.TH. LAPLACE with "la Favorite" 1830-32 and "l'Artemise" 1837-41.

Laplace explored especially the harbours of India.

VAILLANT "Bonite" 1836-37.

Abel Aubert du Petit Thouars "Venus" 1836-39.

THE ENGLISH SCIENTISTS

England also organised expeditions with greater commercial aims.

The first one was sent under the command of F.W. Beechey with the "Blossom" 1825-1828, who had also been instructed to look for Captain Franklin in the North Seas.

Fitzroy's expedition with the "Beagle" from 1831 to 1836 was specially important because the vocation of a great Scientist was aroused during the voyage: his name was Charles Darwin.

Edward Belcher sailed in Pacific from 1836 to 1842 with the "Sulphur". He took part at the end of his important cruise in the Chinese war.

THE ANTARCTIC

The last sailing boats sent around the world in the middle of the nineteenth century went to explore the Antarctic seas.

Dumont d'Urville with "l'Astrolabe" and "la Zelee" made important discoveries in the Antarctic: Terre Adelie, Terre Louis Phillippe, Terre de Joinville... He contributed better knowledge of several groups of islands in the Pacific and of Australia, sailing from 1837 to 1840.

Charles Wilkes was asked by the United State Government to explore the Antarctic seas with five ships from 1838 to 1842. He made important discoveries over there, although some of them were questioned by **James Clark Ross**, an English navigator sent from 1839 to 1843 with "Erebus" and "Terror" (two good ships specially equipped to sail among icebergs) to explore the same countries.

Then the discovery of steam ships changed the aspect of navigation and opened a new era in the history of exploration.

But this period of voyages around the world from 1760 to 1850 was so important for so many fields of Science..... And the work of the artists who have described the lands visited represent the first important iconography showing the inhabitants of the Pacific, Asian, Indonesian ... countries.

THREE MOUNTAINS AND ANOTHER

By HARI DANG

WE took the long-remembered road once again this summer; the road to our mountain, Nanda Devi, in the Garhwal Himalaya.

It lay like an introduction to the hazards of the mountain itself through the towns and dust of the pilgrim route to Badrinath, and across the Rishi 'gorge', that hurdle to the highest mountain in Garhwal.

A month of porter-problems, freakish weather and hard labour later, we received a warm greeting from our old Base Camp, this time a desolate bit of crisp yellow straw and moist, snow-sodden soil. From this camp in the Sanctuary, the route to the Nanda Devi Base Camp lies over several miles of tortuous morainic rubble along the right bank of the Southern Nanda Devi and Rishi Glaciers. It was a sweltering, tedious march and the slim ablation shelf where the Base Camp stares down the glacier came none too soon and appeared a haven of relative stability and evenness after the nerve-racking boulder-hopping on the glacier's surface.

We took three days to stock Camp I, which lies on a thin and steep ridge, then under ice and snow, at a height of 19,200 feet. Here we moved on the fourth day from Nanda Devi Base Camp narrowly escaping a potentially disastrous rock-fall which nearly trapped the writer and three others as it hurtled down a wide chute, announced with little advance-warning by a rolling, cracking thunder.

The entire south-east ridge of Nanda Devi is composed of rotten schist rock which hardly needs the touch of a climber's hand seeking support to avalanche with distressing ease down the steep ice slopes to either of the two glaciers some thousands of feet below. It is exposed to the currents that bring storm cloud and blizzard up the Rishi and over the Sunderdhunga col, and I have never felt less secure than while taking stock of some stance on this wretched ridge, which lower down degenerates into the 'coxcomb', a fantastically weathered and serrated ridge owing its name to its tortured and torn crest.

Camp II was to be established on the crumbly ridge running up to meet the main south east rib which provides the only route, and that implausible in the extreme, to Nanda Devi's summit ridge. But this treacherous ridge was held in thrall by an impartial mantle of ice and snow, an exception from all previous years and attempts that disheartened us. Three days running we shouldered heavy packs in attempts to find the old site of Camp II, used by successive expeditions from Tilman's in 1936 and the French in 1951, to Nandu Jayal's in 1956. This site, christened the Gîte (shelter, literally!) was reputed to be an eight-by-six-foot sloping rocky platform enclosed on three sides by rock walls and threatened on the fourth by a sheer drop to the Rishi Sanctuary.

Of the Gîte, however, there was not a sign and even the most imaginative amongst us could not visualise a possible tent-platform on the democratic pyramid of steep ice that was the ridge. Becoming desperate, always

a mistake in the mountains, we dumped our loads below a wall of ice across and over which we hoped to find or excavate a platform the next day.

The fourth day the dawn was ushered in by a suspicious haze in the atmosphere, as seven of us struggled up the now familiar ridge. We had with us Kalden and Nima, the two sherpas, Bahadur and Kalyan, the two Bhotiyas, and Gurdial Singh, Major Dias and myself. The others had left the mountain finally for various reasons.

We reached our dump in record time, and started cutting steps up the steep ice-wall, wearing crampons against the hazards of a slip. Slip, however, we did. Climbing up to a projection on the ridge, my crampons broke through the thin ice and slipped off the glazed rock beneath, and I was jettisoned down the ice-slope, the ice-axe pick promptly crushed into the ice merely scratching the glassy surface and providing no friction whatever. There was a sudden and life-saving jerk that seemed to shake loose all my bones, as I came stuck against a sharp rock that rose like the word of the Angel through the ice. A close shave, and we breathed heavily for a few minutes before resuming our exploration of that inhospitable ridge for a platform. Then Nima, a sound if slow climber, went down in much the same way as I had done, and skidded some thirty feet before another angelic projection of rock saved him.

Enough was enough, and too sad and reluctant to face facts, we went down to camp after dumping most of our stuff under an overhang, promising fatuously and futilely to return the next day. The Nanda Devi attempt was, nonetheless, over, though we refused to recognise the brute fact. We had worked much to make it possible, and numerous friends and well-wishers had helped us to further the dream; but the Goddess disposed of it as she saw fit. We reached Camp I in a melancholy flurry of snow flakes.

That night we were woken by the first monsoon storm of the season as it rolled and thundered across the Sunderdhunga col from the Kumoun hills, and morning found out tents under a foot of snow. The whole day we waited, confined by the storm, but what hopes we had of a renewed attempt were dashed by the cold douche of another foot of snow the next night, and we returned, dejected, to Base Camp to find that both Thadani and Lhakpa had recovered from their ailments.

Just what degree of risk in mountaineering is justifiable is a point not susceptible to objective estimation since it depends on the individual's approach. Nanda Devi meant a lot to some of us. We had climbed or chased mountain-game around it for over two decades, and yet, to us Nanda Devi was not an end; it was, like all good mountaineering, a way to fulfilment or realisation, and under the circumstances, we knew we were right to turn back. Most fanatical climbs are motivated by other aims, whether they be chauvinism or racial pride, as in the case of the Fascists on the north route to the Matterhorn, or sensation-hunting or prestige, fame or promotion as in other cases. The joy of mountain climbing lies less in fulfilling an objective, though that is there, but rather in living a life according to certain tenets.

Though thus thrown off Nanda Devi, there were other mountains worth our attention, which we could try even in the monsoon. We moved our Base Camp to a grassy terrace in the Sanctuary beside a stream, its surface the

colour and texture of a billiard table. From there the next day we established a camp on a moraine near the Devistan glacier, moving it up across and above the ice-fall to a snowfield lying between the unclimbed summits of Devistan I and Devistan II, at a height of some 20,000 feet. All the party were going well and as we strapped our crampons the next morning with frozen, protesting fingers, the grins on nearly all the faces, from Bahadur and Kalyan, our stalwart Garhwalis, to Nima and Kalden, bespoke confidence. Lhakpa, unfortunately had fallen victim to Kerosene fumes and was incapable of moving.

We plodded slowly up the gentle snow-slope, reaching 21,000 ft without much effort; from here began somewhat steeper ice slopes. Here too Thadani started feeling the altitude and had to be sent back with a Garhwali on one rope. We made good time and surmounted the corniced ice ridge that seems to form the summit to find another cornice rising higher, which took us another half an hour. Clouds covered everything, but fitful breaks revealed to us the gentle summit of Trisul and the ice-fluted ridge of unclimbed Bethartoli in the Trisul Nala on the other side. Some biscuits and a gulp of lime-juice later we were hurrying down the mountain reaching camp in the evening to find Lhakpa weak but better and Thadani making a slow recovery from a bout of vomiting.

Dodging crevasses and glissading down snow slopes in various stances and with varying degrees of premeditation, we ambled leisurely down the grass and sward of the Sanctuary and its flowers and streams, to be greeted by the 'Hi Pu Kyo' (we have reached) of the sherpas, and mugs of hot tea.

The following day was spent like all rest days in the high mountains eating, smoking and talking too much, while Nima, his hands behind his back in characteristic philosophic pose, absordedly carried on a zealous search after wild onions. Or he may have been pondering some esoteric problem of philosophy, it is hard to say from his mask-like face.

Maiktoli is the south western bastion of the Inner Sanctuary, the Sunderdhunga col lying on its eastern shoulder. Though we did not know this then. Maiktoli (22,320 feet) had been climbed by Eric Shipton and a sherpa in 1934, after which both Shipton and Tilman had crossed the reputedly impassable Sunderdhunga col in three miraculous days of ice-work. Their sherpa companion, Angtarkey, still remembers that horrifying crossing and remains convinced of the lovable, laudable insanity of his 'sahibs'.

Maiktoli-wards we moved, springing on the softest, downy grasses, strolling over long flat ablation valleys along the left bank of the Sunderdhunga glacier, playing hide-and-seek with a herd of wary Burrhel on the way, submitting to the soft yet contented melancholy of the Snow Cock's double whistle, our only regret that Thadani again had to go back because, this time, of a recalcitrant stomach.

From a camp on a rocky moraine above the Sunderdhunga glacier at 16,500 feet, we pushed up another camp to a hollow below an ice-cliff at 18,500 feet. The storm-tossed sky of the evening little forecast the clear dawn and we had surmounted all the bad pitches of the Sunderdhunga ice-fall by 9 a.m. the next morning, were even presumptuous enough to hope to climb a neighbouring 21,810-foot mountain on the way back from the summit, which cannot be seen till one is within a few hundred feet of it. With characteristic suddenness the sky became overcast and we found ourselves

struggling against a snow-laden wind that froze the beard on our faces and hung long icicles from our noses. The snow entered our glasses and visibility was reduced to a few yards, except when a rare break revealed a clouded horizon. We groped upwards over a succession of humps, an infinity of space, till thoughts of being benighted or lost crossed my mind. Dias took over in a magnificent lead and topping a corniced ridge, we beheld the corniced summit what looked like a mile of mist and snow away. A loud 'Hi Pu Kyo' told us we were wrong, and soon eight persons were thumping their hands and each other or staring vacantly at the extremely interesting and proximate view of swirling cloud at close quarters, where we had hoped for a magnificent perspective of the Kumoun hills and Almora.

We turned back to retrace our steps, but they lay buried under the fresh snow and the wind blew more in our faces as though it would fain bury the ends of lives under its hoary, callous mantle. We started down despairing of making an easy descent. To go down the ice-fall directly below the summit which we had avoided on the way up would have been fatal, for it rained avalanches the whole day and even in the night; to go too far out and then descend would again lead to trouble, so we clapped our hands and thumped our feet in a shallow crevasse hoping for a clearance in the dense mist. Three hours we waited, but without reward. It was almost evening when we started down in what was a compromise direction between the differing opinions, and after two suspenseful hours identified what looked like a familiar crevasse, reaching camp in another hour.

A day of confinement here to allow cases of snow-blindness caused by the necessity of removing snow-glasses in the mist, to recover, and we were again in the region of flowers and good food, free of the taint of kerosene which the sherpas have a genius for introducing into everything eaten or drunk above snow line. I cannot say they do this on purpose, but even sealed tins of lime juice received their share.

Happy in the thought of our exciting climb, made more so by the hours of doubt when camp was far away, at best, and night drew near, we idled the hours at our Sanctuary Camp, below the temple shape of towering Nanda Devi, eating Nima's onions and listening to Berlioz and Beethoven over our transistor.

Thadani was now fully recovered and keen on climbing some high mountain. Others favoured Rishi Kot, an unclimbed 20,000-foot high mountain in the Uttari Rishi valley, while Dias and the writer wanted to make moonlight ascent of Trisul. Trisul it was to be, and laden lightly, we reached the foot of the gorge in two days, even after making detours to see new ground. Lakes which no human had seen before, green water reflecting the flowers on its banks and the mountains above it; or Burrhel ewes suckling their young or Monal nests with young or eggs in them, or flowers calling to be photographed, these are the real joys of Himalayan roving and we revelled in them.

Three miles below the Rhamani junction the Trisul Nala joins the Rishi and up this we went, through Rhododendron and Birch, over moraine and grassland to establish Base Camp at Tridang at 16,000 feet above the Trisul glacier, with Mrigthuni and Devistan rising to the south and the east, the latter a concave ice and rock sweep from this aspect.

Dias and I established Camp I below a cliff at about 17,800 feet the next day with the selfless help of Gurdial, Dubey and Sharma, who were not interested in climbing Trisul, the former having already climbed it in 1951. We hoped to start on our moonlight venture that night after six hours' rest as it was full moon that night.

Thadani, in the meantime, was setting up a camp at 20,000 feet with Lhakpa and Kalyan Singh, the former in good form since Maiktoli.

Snow began to fall that evening and our hopes receded. The day again dawned overcast, but not as stormy as the night. This had been the first night when the moon had not shone through a cloudless sky, but though we waited another night, more snow and a conviction that the nights would not clear was our only reward and we went down to Base Camp on the fairly clear morning of June 30, as we descended Nima and Bahadur who were accompanying us shouted and we turned to see three figures climbing up at 21,000 feet. It was some consolation to know that though our night attempt had failed Thadani would make it if the day remained clear.

A day of remorseful relaxation, and clouds again rolled up in the evening to support our decision to retreat. But at 8-30 p.m. the glow of the moon from behind Devistan chased the clouds away beyond the new steel grey horizon. Dias and I and Nima and Bahadur hurriedly pulled on boots and crampons and swallowing mugfuls of liquid, set off on our postponed moonlight climb by 9 p.m. from Base Camp at 16,000 feet, for the summit at 23,360 feet.

We climbed rapidly, knowing we had over seven thousand feet to do in one night; four days of normal climbing. But fitness is all in the Himalayas and we were fit. A stream swollen by melted ice forced us to go up a different route but by 2 a.m. we had reached a height of nearly 20,000 feet. As we rested to admire the pallid freize of the peaks of Garhwal, and the moonlit, wind-swept skies of Tibet, Nima fell on his knees chanting 'Om Mani Padme Hum' and Bahadur invoked his private gods. A huge flaming torch of fire rose at the summit ridge of Nanda Devi, moving slowly sideways and disappearing after a few minutes. It may have been a slow and silent discharge from the thin clouds which ionised the air and made it glow as scientists maintain, but I prefer to adhere by the irrational belief that it was indeed, as Nima maintains, the Devi giving her approval (or was she, perhaps, disapproving) of our devotion and the nocturnal venture based on faith.

Much encouraged, we moved on, learning on our way from Camp II that the other party had reached the summit at 5 p.m. the day before. The sky had remained clear so far except for patches of innocuous cloud in the valleys, but now, as out of some hidden cauldron, the sky was overcast with them, a dullness of oiled steel being all that remained of the once bright moonlight.

We pulled on our down jackets against the rising freshet that threatened to become a blizzard, as the clouds conquered more and more of the sky spreading their dark tentacles over one mountain after another like cancer. The rim of the Sanctuary, its necklace, compounded of the jewels of each mountain, gradually succumbed to this occult race, and snow and ice-particles lashed our faces with increasing fury as we debated the advisability of continuing further. We were 21,000 feet high then, and it was 3-30 a.m. Flashes

of lightning punctuated our utterances, and a monsoon storm in all its fury seemed inevitable.

We turned back at 3-45 a.m. chased by a million biting flakes and a howling wind, and nagged by unfulfilled aspirations, yet happy in the memorable six hours of glorious climbing vouchsafed us, when the whole Universe was circumscribed by our thoughts and our vision, when nothing mattered but the next step. The swish and crunch of crampons and the silhouettes on the horizon continued. We had only 2,360 feet more to go and had already done over 5,000 feet in six hours, but all feeling of failure was missing.

Success in the mountains seems as inconsequential as failure if the climb has been joyous and unselfish.

A swift descent and a memorable sunrise over Tibet later, we made our way down to grasslands and flowers again. Thadani and Kalyan and Lhakpa joined us at Base Camp. They had reached the summit after a creditable long day of ten hours and even managed to get some good photographs.

Nine weeks in the mountains were not wasted even if only one worthy memory survives; in fact, there are thousands, which will continue to inspire till the mind loses its imagination. But one memory stands out as the epitome not only of this trip but of mountain roving in general. It is not of failures or successful climbs, nor of individual glaciers and peaks. It is of an alp, a lush flower-festooned alp with a pair of musk deer gambolling with carefree abandon on the thousand flowers, happy and content in their joyousness, closed in their personal Universe which is now also mine, a Universe with regrets and imperfections, a Universe in love with itself.

BOOK REVIEWS

John XXIII, Pope of the Council by S. Aradi, with M. Derrick and D. Woodruff. (Burns & Oates, London, 1961), 234 pages. Price 5 sh.

The biographical sketch of Pope John XXIII contains a vivid account of the life of the Holy Father. Pope John XXIII belongs to an Italian peasant family. He has risen to his position of eminence after a long period of service, spent in the Byzantine world. Prior to his election as Pope he was Cardinal and Patriarch of Venice. He was elected Pope in 1958 as successor to Pius XII.

Pope John XXIII is renowned for his saintliness, and his great regard for the social functions of the Catholic Church. The vexing problem today is the divisions which exist among Christians. Being fully alive to the need for unity, Pope John XXIII has summoned the Ecumenical Council, which is an epoch making event in the history of the Catholic Church. The world today awaits the outcome of this great event. This book will be read with interest by all who desire to know and understand a personality who holds the key to man's spiritual well being. What has been stated in the book certainly deserves careful thought and reflection.

W.T.V.A.

Portrait of An Officer by Pierre-Henri Simon (Translated by Humphrey Hare). (Secker & Warburg, London, 1961). 154 pages. Price 13sh. 6d.

The phenomenon of war poses many intricate challenges to the modern mind, more especially to a mind which is sensitive to moral and spiritual values. Nevertheless, war has always been the main fact of human history. This book raises many challenging questions regarding the philosophy and the psychology of war.

Jean de Larsan, a young French man, around whose personality the story of this book is centred, gives the reader the impression that the mind of the French intellectual is teeming with questions. From the book itself, it will be evident that Larsan possesses the qualities of the social background to which he belongs. His burning sense of loyalty, his indomitable courage, his spirit of self-sacrifice, and the high sense of honour with which his mind was imbued, are reflected in nearly every page of the book. Somehow, he does not seem to realise that these virtues have to be exercised in essentially immoral and inhuman circumstances. In the course of one of his lengthy arguments he recollects the profound truth that "Vice foment war, but virtue does the fighting". This epigrammatic formula does not, however, solve the basic moral issue arising out of war. Modern society glorifies the art of soldiering. One is reminded of John Ruskin's challenging remark: "Men are trained for the art that kills. Let them also be trained for the art that feeds. Teach the plough exercise as carefully as you do the sword exercise."

As Larsan describes his experiences in various theatres of war, starting with operations in Germany during World War II and passing on to the liberation of France, proceeding, thereafter, to Cochinchina and then to the scenes of conflict in Algeria, one is confronted with the basic moral conflict arising between the conscience of civilized man and the honour of the military profession. Are the two reconcilable? Was man created by the Almighty in order that he might destroy his fellowmen, or in order that he might achieve a higher destiny? If it is true that man was made for an essentially creative

purpose, would it not be, then, that the profession of the soldier is not quite so honourable as it is thought to be?

Although this book does not give a conclusive answer to the above questions, there can be, no doubt, that it sets the mind of the reader thinking over deeper questions underlying war and warlike acts. It is very striking, indeed, that at the conclusion of World War II several distinguished war veterans turned away from the glories of military achievement and devoted themselves to a selfless life, serving suffering humanity. The most illustrative examples of this is Group Captain Leonard Cheshire, whose fame has spread through the length and breadth of this country. There can be, no doubt, that as one reflects over this fundamental problem, a turning point is reached which inspires the human mind to direct its attention on the alleviation of suffering instead of glorifying and idolizing the means whereby widespread human sufferings is wrought.

The book concludes with the following words which are rather revealing: "Jean de Larsan was going home broken in spirit, exhausted by having carried out honestly and intelligently his soldier's duty of saving mankind. And as such, I suppose, he must have been pleasing in God's sight." No one will deny that the defensive aspect of a soldier's functions is laudable. It is, however, appropriate that the author concludes his book with a supposition rather than a confirmed belief.

W.T.V.A.

Memoirs of A Public Servant by Lord Salter. (Faber and Faber, London, 1961). 355 pages. Price 30sh.

Lord Salter was a high ranking civil servant and later a representative of the universities in the British Parliament. His book gives an interesting picture of public life in Britain during the present century. He brings to bear the wealth of his experience as an administrator and also as a parliamentarian on current problems in public life. Lord Salter was educated at Oxford. After a distinguished academic career, he entered the civil service regarding which he recalls many interesting experiences. During World War I, he served in the Transport Department of the Admiralty. On him devolved responsibility to create and direct the organization for paying ship owners' claims. He recollects the many crises which had to be faced, and the non-chalant fortitude with which he emerged from them.

The great challenges posed by war conditions created the need to reorientate administration. "A new instrument of Allied administration was created, tested and proved effective in operation. It was no longer diplomatic but direct and executive; the members were, and remained, specialized executive Ministers and officials of their respective national administrations; they were associated, temporarily and for special tasks, in an Allied organization. Since they continued to exercise authority in their own national offices, the new Allied organization consisted in reality of the national administrations themselves integrated into the new interallied institution for a special purpose." There can be no doubt that the moral fibre demanded of the administrator especially during the concluding stages of World War I, was of a very high order.

The problems which World War I brought in its wake were many and varied. In the chapter on Paris and the Peace Conference, Lord Salter discusses some of these problems. Foremost among these was the question of reparations. The French people made exacting demands. France had suffered grievously as a result of World War I. Germany, despite her relatively wider

margin of human and material resources, was not in a position to foot the complete bill. This led to several complications in the reparation clauses of the treaty and led to many squabbles between the Allies. The complete story is ably summed up by Lord Salter in the following words:

"The tale of reparations, its follies and its failures, and its not inconsiderable contribution to the disastrous sequence of world-shaking events, is indeed a sorry one. In the net result, and at the price of incalculable damage, Germany in effect paid the outside world just about nothing. In the early years she made some contributions in kind but such foreign exchange as she paid was no more than the involuntary contributions made by foreign speculators in the mark, which soon lost all its value. In the later years what she paid was less than the foreign loans on which she defaulted. No net economic advantage was obtained for what proved to be infinite political damage. It is little consolation to reflect in later years that, after the second war, reparations yielded not nothing but much less than nothing, the 'reparations in reverse'—the expense to the victorious Allies of reconstructing a country which was devastated, as it had not been in the first war, immensely exceeding any reparations payments."

As one looks back today on the League of Nations and the failures which it encountered during its unhappy life in Geneva, one wonders whether anything of abiding value was at all contributed by this august body. By far the worst problem encountered after the war was the economic problem. Here is what Lord Salter has to say: "The war itself had been so shattering and stupendous an event that it seemed a sufficient explanation of all the distress from which the world was suffering when it ended. Its obvious and direct results in material destructions, the dislocation of world trade, the mountainous burden of debt—both internal and external, and the depreciation of currencies, were in themselves so great that they obscured both the changes in the economic system and society that had already taken place before the war, and also the profound damage which had been done by the war itself to the foundations of that system."

Lord Salter spent some part of the period between the two wars visiting India, Ceylon and China, returning to England in 1931, by way of America. On reaching England he worked on a book entitled "Recovery", which came out in 1932. In the meanwhile, he became a member of the British Delegation to the Assembly of the League. The trade depression of the early thirties and the political complications which occurred in Europe following the rise of Hitler in Germany brought about further complications which eventually culminated in war. The author goes on to describe his experiences during the last two decades, more as a narrative rather than as an expression of his cherished opinions. For the enlightened reader, Lord Salter has provided interesting reading which will without doubt conjure up memories of recent events. Although it cannot be said that the book contains deep or profound utterances, it must be admitted that the approach is matter of fact and realistic. There is throughout the book a ring of sincerity which unmistakably points to the greatness of the author.

W.T.V.A.

I Captained The Big Ships by Commodore Robert G. Thelwell, O.B.E., R.D., R.N.R., (Retd.). (Arthur Barker Limited, London, 1961). 256 pages. Price 21sh.

This is a sort of an autobiography of a British merchant navy officer. In the course of a long and successful life he climbed the ladder of his profes-

sional life rung by rung as an executive officer in the Cunard White Star Line until he had the satisfying distinction of having captained all the major ships in that famous line—Mauritania, Britannic, Queen Elizabeth, Queen Mary and the beauty among modern ships today “Caronia”. It is a story told in a simple forthright manner by a simple forthright sailor. The author rushes past his early life, his joining HMS “Conway”—a stripling of fourteen—narrates briefly his experiences in the first world war and soon comes up to the days he spent in the “big ships”.

The book abounds in anecdotes. His many interesting and informative discussions with “all sorts and conditions of men”, with V.I.Ps. who took passage in the ships; with the little asides; the many tete-a-tete and the more interesting of the many situations he had to deal with unexpectedly as the Captain of a big ship.

No reader will fail to miss the significance of the talks he had with a Texan oil man who took passage in his ship and who asked the Captain “Say Captain, what is your take?”. He was given certain figures to which the oil man replied “Why Captain, I pay my oil drillers more than that”!

No one familiar with ship handling will miss the tense months as he describes the way he handled one of his big ships alongside the pier without tugs and longshoremen in strike-bound New York or the harrowing escape by the skin of his teeth from a collision in the fierce tidal waters of Southampton.

The book is altogether most fascinating and perhaps for the first time, one reads of the inside story of life in the big ships from the point of view of the master of the ship. One more anecdote and I shall have done. By convention, no one ever sits in the Captain’s chair at the “Captain’s table”. It so happened that on one occasion, Mr. Herbert Morrison broke this convention. He promptly paid the fine saying “we live and learn Captain, we live and learn. . . .”

That just about sums up a very interesting book.

D.A.K.

Nelson’s Letters: edited by Geoffrey Rawson. (J. M. Dent & Sons, London, 1960). 486 pages. Price 11sh. 6d.

Perhaps every school boy is familiar with the historic naval battles with which Nelson’s name is unforgettably associated—those trinity of victories of the Nile, Copenhagen and Trafalgar—but not very many, one should imagine, have at all read his letters.

Here in a very compact edition are collected a bunch of more important of Nelson’s letters, memoranda and despatches along with his own story written in 1799 for the Naval Chronicle at the request of its editor John McArthur.

In the first section of Nelson’s letters covering a period of 16 years from 1777 to 1793, we see him on active service, in the West Indies and Leeward Islands, an unknown naval lieutenant slowly making his mark and rising in his profession. He tells in one of his early letters with a touch of justifiable self-satisfaction: “Lord Hood was so kind as to tell him (Prince William) that if he wished to ask questions relative to Naval Tactics, I could give him as much information as any officer in the Fleet”. This was in 1783 when he had just turned 25. This tactical acumen was to come to full flower in the great

naval engagements that lay ahead. It was during this Caribbean interlude that he fell in love with Mrs. Francis Nesbit, a young widow, whom he was to marry. It is amusing to note in this connection that in February 1785 he was bravely writing to his brother: "They trust any young lady with me, being an old-fashioned fellow." A few weeks later, love had swept him off his feet like a storm at sea.

If these early juvenile letters are rather stiff, halting and self-conscious, those written between 1793-1805 when Nelson was at the height of his powers, increase in range, variety, vigour, amplitude in proportion to the scope of his duties and the brilliant successes which attended him increase in magnitude. It was also during this period that he was to exhibit a quality of his character which was to earn him bouquets as well as bricks. Speaking of Admiral Hotham, his Commander-in-Chief, he was to write to his wife "Hotham has no political courage which is in an officer abroad as highly as battle courage". He had a share of both in ample measure.

We see him in moments of crisis. There is the dramatic, though unsuccessful, Commando raid on Santa Cruz, in which he lost an arm having already lost an eye at the siege of Calvi; the battle of St. Vincent where he showed his tactical skill by leaving the line of battle prescribed by his admiral and sailing alone into the enemy's fire; the classic and complete victory at the Battle of the Nile; the bold move at Copenhagen, made after the Commander-in-Chief had hoisted the signal of recall, which came off; then finally that domestic crisis which estranged him from Lady Nelson. It was in 1793 that he met Lady Hamilton at Naples and what began as a platonic friendship developed into a love affair as romantic as that of Parnell and Kitty O'Shea. In his letters to her we witness the passionate, soulful outpourings of a man who had often snatched success by going out of the line of duty. "You, my beloved Emma, and my country, are the two dearest objects of my fond heart—a heart susceptible and true. Only place confidence in me and you never shall be disappointed. I trust all your dear letters, because it is right for your sake and I wish you would burn all mine", he was to write to her. Lady Hamilton for reasons of her own preserved them and many of them find a place in this book.

The letters all in all exhibit the simplicity—what he himself called "plainness of nature"—and the integrity of his character. In one of the most turbulent periods of European history, full of cruelty and barbarity, he stood both as a civilized commander beloved by his officers and men. In them we see his development from an unknown naval lieutenant to a national figure full of glory and renown, from a devoted husband to a romantic lover, more and more unwilling to turn the blind eye to the dictates of the heart, as formerly he was sometime prone to do to those of his superior commanders.

M.J.R.

Lure of Everest by Brigadier Gyan Singh. (The Publications Division, Ministry of Information & Broadcasting, 1961). 212 pages. Price Rs. 12.50.

Lure of Everest: An apt title. For, within it, we read what it was that enticed gallant mountaineers to endeavour to scale the heights of Everest in spite of the obstacles and dangers one associates with mountaineering and particularly with the ascent of Everest.

This book is in line with the other great books on mountaineering written by Shipton, Routledge, Smythe, Younghusband and other great mountaineers

of the past. Further, this book maintains the fine traditions set by them. There is this important difference, however, that whereas in the books so far written on Everest and its adjacent peaks one was made familiar with names such as Mallory, Irvine, Norton, Hunt, Yynne Wager Ward and others, in the "Lure of Everest", we for the first time hear of and read about our own mountaineers Jungalwala, Vohra, Gyan Singh, Kohli, Sonam Gyatso, Bunshah and others; pitching tents in South Col "the most inhospitable and silent region on earth" and going up to the south summit and south ridge of Everest and so on.

It does good to read about Indians in these distant, high and inhospitable regions.

The book is the story of the first Indian expedition to Everest; of the preparations made; of the hundred-and-one things that had to be catered for and done and transported to the base camp initially and then up, to the various camps along the route to the summit; of the trials and tribulations that were experienced along the route, of the indomitable courage and perseverance of individual members of the expedition and the disappointment not unmixed with pride and restrained optimism when defeat stared in the face and finally the return, without the peak having been scaled.

Perhaps, only a mountaineer will understand the full significance of this disappointment, nevertheless the lay reader will also gain some idea of what this disappointment must have meant to those who had gone through the full rigours, had scaled the treacherous ice-fall, crossed the western cwm, clambered up the Lhotse Face, "the second big hurdle" as the author calls it, the dreaded "South Col" and to crown them all—the final attempt. Further, there is something odd in a reviewer sitting in the warmth and comfort of his room and writing about mountaineers experiencing the full rigours of the weather and the fury of the blizzards, and no reader will fail to be aware of a peculiar feeling as he reads the pages of the book.

The foreword by Jawaharlal Nehru describes in his inimitable style the basic urges which inspire mountaineers, and his pride in his countrymen's endeavour to scale this tremendous peak. The book is well planned and well brought out with a number of very interesting and clear photographs and a comprehensive index. One word, however, about the beautiful line-sketches interspersed throughout the book—a welcome feature. I looked in vain for the artist. A pity.

D.A.K.

The New English Bible, New Testament. (Oxford University Press, Cambridge University Press, 1961) 447 pages. Library Edition. Price 21sh.

This English translation of the Bible has been produced by the major Christian bodies (other than Roman Catholic) of the British Isles. It is offered simply as the Bible to all who in reading, teaching or in worship may care to use it. It has been written in modern English so that the texts of the Scriptures could be understood by the modern man. For purposes of reference, and of comparison with other translations, verse numbers are placed in the margin opposite the line in which the first word belonging to the verse in question appears. Sometimes, however, successive verses are combined in a continuous English sentence, so that the precise point where a new verse begins cannot be fixed; occasionally in the interests of clarity the order of successive verses is reversed.

The question as to how well the meaning of the Scriptures has been expressed through the medium of modern English is a matter on which experts on Biblical Theology might have something to say. The lay reader will perhaps find the new translation more easy to understand than the authorised version. Those who are accustomed to the language forms used in the authorised version of the Bible will no doubt prefer that version, although it contains several archaic expressions. All things considered, it cannot be denied that this new translation represents a sincere effort to make the Bible meaningful to the modern mind.

W.T.V.A.

Decision, Order and Time in Human Affairs by G. L. S Shackle. Cambridge, University Press, 1961). 302 pages. Price 35sh.

Prof. Shackle has dealt with a subject of considerable current interest. Not only from the point of view of the statistician but also from that of the economist. He records decision as "A cut between past and future, an introduction of an essentially new strand into the emerging pattern of history." In fact his present book is a sequel to his earlier writings, in which he has expounded such concepts as expectation, uncertainty, decision and time. The book has been laid out in five parts. The first part is on the theme of Time. He maintains that decision is origination or creative in the deepest sense. The sum and substance of his argument is that "If decisions are creative each injecting into history something essentially novel, something which is not purely the inevitable outgrowth of the past, decisions are unpredictable and so, therefore, is history." He goes on to say that "The set of rival hypothetical outcomes of each available action is not prescribed like those of a game with completely stated rules. The outcomes imagined by the decision-maker for each act may not be determined by his past but may contain something not to be found in any account of his experience; an element of 'inspiration'."

The second part of the book is on the subject of "Uncertainty". He discusses several current concepts in this connection and analyses their several implications. The main point which he emphasises is this: "For any individual, a thing is possible so long as he is unaware of any incompatibility between that thing and the texture of the natural and the human world, and between that thing and the existing situation of that world with its not unlimited speeds of change. But there is no logical or formal limit to the diversity of things which can all simultaneously seem thus to be able to accommodate themselves to the nature and situation of the world, even when these things are mutually contradictory and mutually exclusive; possibility or potential surprise is non-distributional." He then goes on to say that "Potential surprise is a measure of possibility. Possibility of what? Possibility for the individual to attain some imaginative experience. Such experiences are inhibited or dimmed by a barrier of disbelief, of imperfect acceptance of the congruity of the imagined situation or chain of situations with what he knows of the nature and current state of the world. The part played by an uncertainty-variable in our scheme is as a measure of the strength of this barrier in certain directions, and a means of indicating which these directions are, so as to make possible a statement of the constraint subject to which the individual can create his imagined future. We therefore measure possibility in the reverse sense, by a measure of disbelief which stands at zero to indicate perfect possibility."

The third part of the book deals with "Ascendancy". In this connection he maintains that the imaginative experience which is the most satisfy-

ing has to fulfil three conditions—first, what is visualised is in some aspects desired for itself; secondly, that it is looked on as in some degree possible, and thirdly, that the action for which these outcomes are created is the one to which the individual's decision has committed him. The ascendancy function is discussed in terms of its arithmetical implications. This leads him to conclude that "if the choice which the decision-maker is about to make is between several investment schemes each requiring the same investible sum, and if this sum is only a part of the decision-maker's "fortune" in our sense, then he must be supposed to intend one and the same use, in each case, for the rest of that fortune. This will be the most natural and usual situation, for an enterprise will be newly founded only once, and entirely transformed in purpose, organization and equipment hardly ever, but it may many times call for extension or the re-equipment of one division or component plant. In such a case there will be no question of altering the deployment of most of the net value of the firm's possessions; this part of its "fortune" will remain embodied in the equipment or the paper assets in which it is; the question to be decided is simply the destination of the remainder of that 'fortune'."

The fourth part of the book deals with "expectation of change of own expectation". He discusses at some length the circumstances under which a decision-maker changes his own expectations and the basis of such changes in expectation. The last part of the book contains some illustrations from the field of economics.

The essential point made in the book is the notion of decision as a part of a continuing creative process, the introduction of a new strand in the emerging pattern of history, which leads Prof. Shackle to develop a new theoretical model for decision making. Although the book has primarily an economic orientation, it has a bearing on the problems of Mathematics, Sociology, and Psychology.

W.T.V.A.

Working With Groups by Josephine Klein. (Hutchinson, London, 1961) 235 pages. Price 35sh.

Dr. Josephine Klein is an eminent social psychologist of the United Kingdom. Her earlier book entitled the *Study of Groups* published in 1956 was a useful aid to the understanding of the new interests in social psychology kindled during the post-war period. This book, which has been written mainly for the enlightenment of university students and the guidance of social workers, goes one step further in helping those interested in the subject to interpret the findings of people who work with groups in a professional capacity.

The book covers important questions relating to group action. When a group of people have to perform a set task, it is necessary that they should plan their line of action and take a decision on which everyone is substantially in agreement. The decision making sequence thus involves exchange of information and of views before a decision is reached. This process has been scientifically analysed and discussed in the opening chapters.

Although it may be true that individuality is lost to a certain extent in group activity, it is also a fact that self-expression of sympathetic response of others gives an individual some assurance of his own worth. What is of practical interest in this connection is the emergence of leadership in the group situation. The author brings out the interesting point that the qualities

of a good appointed leader in formal organization are those of a good leader in a self-selected group.

For good morale, there must be sufficient resources to permit the performance of a task. All members should have access to these resources and should be able to contribute to them. The members should share the values which are furthered by the performance of the task. They should be clear as to how the resources could be utilised in the furtherance of the task. These are some of the important points regarding group morale which merit attention.

One of the chapters in the book contains verbatim records of two group meetings. Considerable interest surrounds the psychological analysis of what transpired at these meetings. This is certainly something which should be studied with care. All things considered, the book is highly useful from the practical point of view. It throws considerable light on the structure and functions of groups. It is a welcome addition to existing literature on the important subject of Group Psychology.

W.T.V.A.

"Rebels In Paradise" by James Mossman. (Jonathan Cape, London, 1961). 257 pages. Price 18sh.

Civil war normally means not only bloodshed but intense bitterness. Possibly it is the Indonesian character with its genius for compromises which makes "Rebels in Paradise", a journalists' notebook of the civil war in Indonesia, pleasant reading. The rebels broke from the Central Government because they disagreed on principle, the principle being resentment at an over-centralised government, and sought local autonomy. That they might have been encouraged to do so by Western power-politics and the "comic-opera activities" of the American Central Intelligence Agency, with assistance of arms and equipment, and promises of even more, is more than suggested. That the rebellion folded up, at the end of one of modern history's "politest and most ambiguous" civil war, was not only due to the efforts of President Sukarno's Government, but might also be attributed to a change of the policies of the Western Powers to that government.

The author explains these views but is concerned even more about the effects of Western assistance vis-a-vis the Communist menace in Indonesia. He explains that together with the Central Government's fight against the rebels went on two other campaigns—one against the reactionary Darul Islam movement and the other against the Communist Party. Both these supported the Government against the "rebel colonels" for their own ends but in the ultimate analysis the culminating effect of these activities would be to weaken the authority of the Central Government. The author is convinced that Western policy in regard to Indonesia, and other "neutral" nations needs readjustment. In his own words, and in the serious but short section of the book he has the following to say:

"The most significant weapons of the cold war if it can still be called that, are not guns and threats, but the appeal of education (offered with humility, nor superiority), technical aid, cheap credit, and an at least apparent respect for other people's idiosyncrasies.

"If the Western powers are to compete with the Communists in the East in this kind of cold war, they must stop staking right-wing dictatorships and

giving large-scale military aid to countries which are too underdeveloped to cope with it. They must be prepared to pool what wealth they can spare, and distribute it in the form of economic and technical assistance to all who need it. Indonesia would certainly be high on such a list.

"Above all—and this, I think, would be the bitterest pill for some Western states to swallow—the money should be administered through an international agency, perhaps the United Nations. It should not be administered by national governments, since, however innocent their intentions, they can never escape the charge of attaching political or ideological strings to their offers.

"If aid could be provided in this form by the rich slice of the earth, for the benefit of the vast poverty-stricken, slice provided without strings, the only condition being its sound application to worthwhile projects—then I think the West might say it was countering the challenge of communism in the under- in a self-selected group.

"As it is the Communists believe that in this kind of cold war, time is on their side. In South-East Asia the West is not doing very much these days to persuade them that they are wrong."

This book is not all seriousness though, and there is much to interest anyone in search of easy and interesting reading especially when Indonesia is once again in the news.

A.M.S.

Book of Rifles: An Encyclopædic Reference Work by W.H.B. Smith. (Harrisburg, Stacpole Co., 1960) 576 pages. Price \$10.00.

This is the revised and expanded edition of the work originally published in 1948 as *Rifles—Volume II of the N R K Book of Small Arms*. With the inclusion of additional material, covering latest developments, the work has rightly been elevated to the title of *Encyclopaedic Reference Book*. As the essential facts and important characteristics of both the military and sporting rifles have been condensed for the sake of brevity, it can be considered as a comprehensive reference book for those only who possess a working knowledge of small arms.

The book is divided into four parts. Part I gives a historical background of the evolution of small arms. Commencing with the origin of gun powder in the Middle Ages, this part traces, step by step, the salient features in the evolution of the gun through its various stages of development, culminating in the production of bolt action and semi-automatic rifles. This part also throws light on the important aspects of the development of ammunition, both the bullet and the cartridge.

Part II deals with types of rifle actions. This chapter firstly traces the development of single shot rifles and rightly points out that by far the most common design in modern single shot action is the familiar turn-bolt action. Then it goes on to deal with repeating rifles, i.e., rifles equipped with a magazine. The advantages and disadvantages of various types of magazines, such as, tubular magazines and box type magazines, are vividly brought out. This part, after describing the types of actions used in repeating rifles touches on the recent development of semi-automatic, i.e., auto-loading types of actions

used by various manufacturers of rifles. All the three types of actions, i.e., blow-back action, the recoil action and gas-operated action have been explained, the first, of course, being the most simplest and the cheapest.

In logical sequence, the authors then turn to the detailed description of modern rifles in Part III of the book. For ease of reference the nations of the world and the most prominent manufacturers within a nation have been listed alphabetically. Data on only those military and sporting rifles has been included which are in current production, or for which ammunition is still available. This perhaps is the most important part of the book and it shows at a glance the leading manufacturers of rifles in the world and their national peculiarities and idiosyncrasies in design and production. This part also brings home to the reader that the guns built in privately owned shops may differ in weight, length and other characteristics from similar standard factory models, a fact which often tends to confuse the uninitiated.

Part IV of the book is a post-war supplement. It unfolds the attempt being made to supplant the bolt action rifle with full or semi-automatic rifles in order to meet the tactical requirements of the modern infantry soldier. An interesting point made in dealing with this change-over is the stress laid on the undoubted superiority of the bolt action rifle used with telescopic sights. In other words the bolt action rifle will always have a place in modern warfare as a specialist weapon, a fact which is apt to be overlooked in the excitement of new developments. Two other points worth mentioning are: firstly, the advent of the automatic rifle has not lightened the burden of the infantry soldier as it was expected, and secondly some countries have discarded the fully automatic pattern in preference to the semi-automatic weapon, mainly on the grounds of accuracy and economy in ammunition expenditure.

The reader may be interested to learn about the innovation i.e., the replacement of ordinary metallic sights by an optic sight, introduced for the first time, in the manufacture of the British EM-2 Assault Rifle. While using the optic sight the shooter has to contend only with the post reticule, permitting faster and more precise aiming. This sight also provides a reliable medium for judging distance. It is a pity that Great Britain decided, for political reasons, to drop the introduction of this weapon in favour of the FN NATO Assault Rifle, and thus lost an opportunity of proving the superiority of a weapon fitted with an optic sight for precision shooting.

The controversy over the strength and power of cartridges has also been dealt with, indicating that most countries now favour the medium range cartridge.

A particularly noteworthy feature of this volume is the inclusion of 32 special three-dimensional halftone drawings, showing the functions of the working parts of important rifles.

An excellent reference book on rifles which should decorate the selves of every military library.

G.S.

The Book Of Pistols & Revolvers: An Encyclopædic Reference Work by K. H. B. Smith. (Harrisburg, Stacpole Co., 1960). 718 pages. Price \$10.00.

The Book of Pistols and Revolvers was first published as the N R A Book of Small Arms—Volume I—Pistols and Revolvers. The revised edition, which

covers the history and basis design of one-hand weapons gives an exhaustive technical and ballistic data and description of innumerable weapons, also includes new material on post-war developments. A notable feature of this work is that it contains only checked and corrected and thus authenticated data on successful weapons and cartridges. To help the reader in grasping this invaluable material, nearly 700 illustrations and three-dimensional half-tone drawings have been inserted. The authors have thus avoided the pitfalls and errors which occasionally are made by intelligence sources and even expert users in circulating unauthenticated reports.

The first two chapters of the book give a vivid picture of the evolution of the one-hand gun from its primitive crude state to its present form of a highly refined and accurate modern weapon. The story starts with the origin of the cannon lock and goes on to describe gradually improvements in the shape of match lock, wheel lock, flint lock, culminating in the discovery and adoption of the percussion lock. The narrative also covers the parallel development of the charge and missile, resulting in the adoption of the metallic cartridge. The analysis of the probable origin of the term "pistol" is both interesting and revealing. These chapters end with a thorough analysis of the types of pistols and revolvers in vogue. One comes across such famous names as Colt, Mauser, Browning, Webley and Smith and Wesson.

The remaining chapters of the book give a comprehensive description of the various types of pistols and revolvers calibre-wise. This description contains essential details of every weapon, such as the length, weight, date and country of manufacture, type of action and ammunition used and magazine capacity. The devotion of the major portion of the book to systematic enumeration of this background knowledge makes it a really worthwhile encyclopaedic work.

The book has three appendices which are replete with useful information. The first two contain pictures with essential data of all the well-known pistols and revolvers, thus making their identification feasible to any research worker. Appendix III, on the other hand, contains a glossary of such terms and definitions ignorance about which is widespread even in the Services. A study of these terms will greatly add to the knowledge of any student of weapons.

Lastly, there is a supplement on post-war developments produced by the well-known hand-gun and ballistic expert, Kent Bellah. This supplement presents under appropriate headings many new developments in the field of hand-guns which have come about in the past decade.

The book is the product of intensive research and hard work in the field of hand-guns and should rank as a repository of authenticated information on the evolution of pistols and revolvers.

G.S.

Our Times—1900-1961 by Stephen King-Hall. (Faber & Faber, London, 1961). 352 pages. Price 28sh.

Between the point where the school histories leave off and contemporary memory begins is a gap which this book fills and helps to freshen up the memory. We are given what may be called a stop-press review of the historical events of the past sixty years (how palpably the disingenuous personal pronoun pops up at the most crucial moments of the story and associates itself with the *dramatis personae*!) and told of some of the causes that brought them about. If the reader were to ask, the author seems to say, why 1900 has been chosen as a sort of benchmark, the only reason could be that that wholly beneficent, all-

pervasive influence—it could not possibly be called an institution—of Pax Britannica was fatally on the decline. If only merciful Time had given it a shot in the arm and allowed a further lease of fifty years how wonderfully peaceful and prosperous the world would have been! To quote his own words:

"The affairs of men are punctuated with ifs and buts, but IF the Pax Britannica could have endured another fifty years humanity might have been spared much misery, and the second grim and fearsome event of the arrival of nuclear energy might never have created an ominous question mark over the future of mankind."

So the book, it would appear, is not for learned academics, who, while reading it, may be remorselessly inclined to feel for the red pencil.

Nevertheless it should not be taken to mean that there are no saving features. Of course, there are. The chapters on World Wars I and II, particularly the summaries on war at sea, are, within the limits imposed by the form of the book, both lucid and competent. He scores a point when in examining the nature of World War I he says that it was the first occasion in history when, notwithstanding the Napoleonic wars, war became total "so that efforts were made to harness all the resources of the nation, human and material, to the war effort." World War II differs from its predecessor in that in the latter "the people had to learn what was involved in total war, whereas in 1939 no one doubted that the war would be total even though the precise character of its totality could not be foreseen."

The other competent surveys are on the Slump, Suez crisis, Russia and China, which one finds are not after all as black as they are painted by some, and Nuclear Disarmament.

Between this highlighted dominating ground, however, is a flat country of varying shades of grey, where one is apt to find certain odd things. There is, for instance, the fervent belief that in NATO one can find the embryonic structure of a United States of Europe. There is again the incomprehensible silence which envelopes that vast land mass between Suez and Japan during the inter-war years. One begins to ask: Could life in these countries possibly have gone into deep freeze? Not even a whisper emanates from post-1945 Indonesia, which, for all one knew, some seismic shock might have scuttled into the surrounding sea.

It is not given to all to be everything to everybody, but the author carries it off with aplomb. He casts, as we have seen, a nostalgic backward glance at Pax Britannica; he is the flag-bearer for the United States of Europe; in the case of self-determination for African colonies and territories with multi-racial societies he is all for "gradualism"; on nuclear disarmament he is on the side of the unilateralists. This is not to say that the author's personal preferences, though apparently incompatible, do not ring sincere. It is only that taken together they do not add up to a consistent point of view. To say the least, this benevolent conservative-radical amalgam does not mix well.

At the close of the book one may legitimately ask what have these hurrying years to declare? Only two notable events, it would appear, have emerged out of the flux of time—the eclipse of Pax Britannica and adoption of nuclear energy. One wonders whether this is all there is to it, irrespective of the geographical position from where History's ticker-tape is read.

Nevertheless with all its faults of detail and diagnosis it provides lively reading. The author has a good eye for the general features of the landscape and a knack for describing current affairs and of disengaging those which are of special moment.

M.J.R.

The Peace Makers by Marquis Child (Hammond, London, 1961), Price 15sh.

The relationship between foreign and military policies has reached such a stage that in the era of a nuclear plenty, any decisions taken in the diplomatic field have extremely far reaching consequences in view of the totality of nuclear war. These facts are not easily comprehensive to the average man in the street and yet it is his pressure, built up through public opinion, which exerts influence on policy decisions especially in the United States and in England.

In explaining this basic part of politics of the modern world, Marquis Child has done great service in his novel "The Peace Makers". The venue is Geneva. The Foreign Ministers of the USA, Great Britain, France and Russia are meeting to discuss the long term solution of the problems of North Africa. In the meantime the French are involved in a sudden adventure and advance towards Tunisia where their forces are about to come in contact with each other. The Tunisians are assisted by "volunteers" and both sides are armed with nuclear weapons. It is only later in the story that we come to know where the volunteers have come from, but it is known throughout that they are from the communist bloc. In this situation, the United States military, in the shape of brilliant but fiery General Galihan, comes forward to suggest a precise clear cut military action in which not only are the logistic and operational plans calculated but so are the casualties and the areas of radiological contamination! The eventual solution, which is to bring in the United Nations observers to see to it that the French aggressors return to the Algerian border is arrived at only in the face of considerable opposition from the expected quarters.

With this as the outline, the author weaves a skilful story with plenty of human interest. The American press and T.V. and lobbying politician are well represented as they are in real life. The difficulties of explaining to the lay public the complexities of the situation are beautifully put over. "The Hamlet malady" which the Western powers seem to be suffering from—so that doubt come easier to the mind of their statesman, rather than decision, is explained, and one hopes understood by the American public, which always seems to expect the picture to be in clearcut black and white. The Americans fear that the British have lost their vigour. As the author puts it, "the British got a considerable shock in 1940, and now they have put everything back just as it was before. Ascot, Goodwood, the trooping of the colours, all the pillars of the establishment have been put back as before. But they are so fearful that something is going to happen to it again." This fear is so dominant that they draw back from any suggestion of radical change. On the other hand the British feel that the Americans are naive. They do not understand the implications of the changes that they propose. They have a feeling that in the ultimate analysis not only the Western powers but Russia itself would have to stand four square together against the invasion not of the Huns or the Goths as the Roman Empire had to face, but the people of colour—yellow, brown and black.

The author continues his analysis of the weaknesses of the Western world by pointing out to what would appear to be a feeling of the break up of family ties amongst the senior members of their delegations. The French Councillor's wife is so unbelievably busy that he can scarcely even see her. As the author puts it, "if they happen to be at home the same night they may sleep together in a good friendly way and that is not important." The most brilliant member of the American team feels himself lost. His beautiful and very rich wife seems to be the model of perfection to others but he seems to have lost all his feelings for her. The beautiful Lady Cynthia, wife of the senior British civil servant transgresses the bounds of her bitter marriage to find a passionate happiness elsewhere. The author might well be implying that the Western powers too have had the seeds of decadence sown amongst some of their leaders, and they too like the leaders of the Roman Empire had begun to lack the will to survive.

With this as material of the novel, this book is well worth reading by anyone interested in understanding the working of world power politics and the weakness of the West in particular in the face of what would appear to be a monolithic communist front. The author goes on to throw doubt on this also, and implies whether this is a fact or a myth created by the Western world to provide a convenient bogey to cover up their own inadequacies.

Altogether an interesting and thought provoking book.

A.M.S.

American Foreign Policy: Theory and Reality by Louis J. Halle. George Allen & Unwin, London, 1960). 327 pages. Price 25 sh.

Any book is welcome that attempts to unravel the Gordian knot of American foreign policy, which has assumed in recent times unprecedented proportions not only in terms of its complexity, but in the number and magnitude of the problems which are challenging the best minds in the world today. Men and Governments are strained almost beyond endurance merely to comprehend them intelligently and how much more difficult then will it be to solve them? The author rightly compares the foreign policy of John Adam's days to the present day Kennedian regime and points out how much it had grown in the last 150 years. While it was conducted by "six or eight seasoned men, in private rumination and consultation among themselves", the author describes how it is being handled today by "hundreds of diverse persons with the governmental bureaucracy, from speech-writers to experts in ballistics."

Mr. Halle, who was a former member of the State Department's Policy Planning Staff, is naturally well conversant with the ropes and, therefore, writes from personal experience of the American Government and her peoples. The book is not another recital of selected events in American diplomatic history, but is a sympathetic, and occasionally even ironic, appreciation of the imperfect humanity that is represented by foreign policy in general. Agreeing in general with Tocqueville's prophecy that the United States was doomed because of the incompatibility of democratic processes with the effective conduct of foreign relations, the author details the difficulties experienced by the Founding Fathers in reconciling idealism with *Realpolitik* in the conduct of foreign relations.

The successive chapters of this valuable book bring out in clear outline the various elements of tragedy implicit in all history, namely, the sequence

of hope and frustration, or of dream and reality, particularly in relation to American history. The gradual manner by which the traditional policy of the United States became obsolete in 1898 by her blundering into the acquisition of the Philippines and the fifty years since then, which the country had taken to grasp that fact and adjust her thinking to the changed situation, are described by tracing the course of the American foreign relations which had often been subject to personal whim and predilection and to sentiment and notions of abstract morality unrelated to reality. Rightly does the author point out that the conduct of foreign relations is no less subtle and complex than the business of banking, as it calls for sophisticated skill and knowledge based on long experience. This, in turn, requires such a professional corps and such professional thinking as can be built up only over the generations.

The difficulties of American foreign policy in the last decades have mainly stemmed from the fact that the U.S. stepped out of her isolation in 1898 with the indispensable equipment for building an active and responsible role in the world and it took her nearly half a century to develop it. Here comes to mind the relevance of the memorable words spoken by Winston Churchill addressing the House of Commons in the grim days of 1940, words born out of his considerable experience in foreign affairs:

"It is not given to human beings, happily for them, for otherwise life would be intolerable, to foresee or to predict to any large extent the unfolding course of events. In one phase men seem to have been right, in another they seem to have been wrong. Then again, a few years later, when the perspective of time has lengthened, all stands in a different setting. There is a new proportion. There is another scale of values. History with its flickering lamp stumbles along the trail of the past, trying to reconstruct its scenes, to revive its echoes, and kindle with pale gleams the passion of former days."

This invaluable book should be in the hands of every political commentator and foreign affairs expert as it shows how the new World has emerged once again from the woods and caught up with the realities of international developments and has forged in the Truman Doctrine an appropriate instrument of foreign policy, as she had in the early days of the Republic.

"S.R."

The Anglo-American Predicament by H. C. Allen. (Macmillan, London, 1960). 241 pages. Price 15 sh.

The imperative necessity for a Federal Atlantic Union not only to strengthen the West in its struggle with Communism but to fortify democracy and thus fully develop the prosperity of the Free World forms the major theme of the book under review. Such a Union, according to the writer, should not be an exclusive organisation but should be the first practical step in the direction of a world society combining order with liberty. The value of the book is enhanced particularly by the fact that Britain is now in the throes of one of the supreme crises of her history being faced with the problems of entering the European Common Market.

Although the public may not be sufficiently aware of the fact, there is no gainsaying the fact that Britain's international destiny will be more profoundly affected in the coming years by the nature of her foreign policy than it has been at any time since the beginning of national sovereign States in

Europe at the close of the Middle Ages. Although Britain and the European Nations have gone beyond the stage of Nation States and are stepping into the threshold of super-national Powers and of great Federal Unions, the difficulties of Britain entering the European Common Market lie in the fact that she is not in a true sense an European Power, because of her extra-European political ties and her widespread Commonwealth and Empire interests. The author is of the firm conviction that there is no alternative for Britain except to form an Atlantic Union which alone, in his opinion, can really satisfy her needs amidst the super-national Leviathans of the twentieth century. What is more, he adds, such a Union alone can make the West sure of the victory in the struggle with international Communism. It is to educate the British public of the necessity for such a European unity and to stimulate action to produce that outcome that the book has been written and, as Mr. Allen confesses at the outset, this is a tract for the times. Still, it is not devoid of the work of scholarship, being studded with appropriate statistics, quotations from learned publications and ample bibliographical notes.

While one may not agree with the conclusions drawn in this book, it is worthy of due attention as it is related to a burning topic of the day. The rather recurrent insistence about the unique position of Great Britain among the nations of the world may be irksome but the values which the Westerners have come to hold most dear are quite well detailed; and in that context the thesis, which the author upholds, may be correct. He seems to be still steeped in the myth of Britain being, in Shakespeare's words:

"This royal throne of kings, this sceptred isle,
This earth of majesty, this seat of Mars,
This other Eden, demi-paradise,
This fortress built by Nature for herself,
Against infection and the hand of war,
This happy breed of men, this little world,
This precious stone set in the silver sea,
Which serves it in the office of a wall,
Or as a moat defensive to a house,
Against the envy of less happier lands,
This blessed plot, this earth, this realm, this England."

and thus ignore the newer forces and the winds of change blowing from across the resurgent countries of Asia and Africa. Granted that Europe is father of Western civilization and that America is blood and mind of the West, the author contends that the creation of the Atlantic Union is specially a problem of Anglo-Americans and that is again the essence of the Anglo-American predicament. One is reminded here of a wag's impertinent remark that it would not be long before Britain gives up her national game of cricket, if this series of Indian victory in the M.C.C. tests is continued even as Adlai Stevenson and Lord Home have already begun to see the futility of the United Nations on the simple score that, instead of being a purely Anglo-American preserve, it has now been strengthened by the addition of Afro-Asian nations. Here, in truth, seems to lie the Anglo-American predicament, namely, the failure to see the sign of the times and thus shake off their Canutelike stand against the rising tide of resurgent nationalism of Asia and Africa.

S.R.

Russia Forty Years On by M. Philips Price. (George Allen & Unwin, London, 1961). 132 pages. Price A-18sh.

One of the notable post-war features is the swelling library of books on

Soviet Russia that have come out of the West. This is in fair measure indicative of the power and prestige Russia has achieved since the war and the realization that the future of civilization depends very materially on whether Russia and the Western nations can live amicably together.

Mr. Philips Price's book is especially worth having since he is one of the very few people who have travelled the country during the reign of the last Tsar, was in the thick of things during the October Revolution, when he met Lenin and heard him speak in the Kitai-Gorod, and visited the country again in 1948 and 1959. The result is a wide spectrum of impressions of the old Tsarist Russia and the new dynamically changing Soviet Russia. He compares the two and has some perceptive things to say of them. The early revolutionary ferment he feels, is in the process of cooling and the situation evolving towards stability. This trend, he says, is likely to continue. As long as it does there is hope for peaceful co-existence.

In his panoramic survey he has also some interesting comments to make on women's dress—"saved from the fantastic fashions of the West", on the great development in pictorial and plastic arts, housing, household amenities, which because of the high prices "makes them (the people) keep their demands down to the minimum. They prefer to spend the money on books, the opera, and the theatre, all of which are very cheap, cheaper in fact than in the West. For the Soviet State and the municipalities provide many things on a non-economic basis for the benefit of the citizen". He also remarks that "the national income is more equally distributed now than it has ever been". But when one looks at the internal situation and tries to interpret it, says Mr. Price, "one can only come to the conclusion that Russia is in the primitive non-durable consumer goods and early capital construction stage. This is an altogether artificial set-up and results in Russia being in some forms of industrial production ahead of all other countries in the world, yet behind in matters of ordinary clothing and footwear for the civil population". It is possible that this imbalance will be corrected progressively as Russia achieves greater confidence in a secure future.

At the end of the book there is a similar exercise in prospect and retrospect concerning Germany.

This is an altogether delightful book providing an hour's instructive yet at the same time enjoyable reading.

M.J.R.

The Awakening Sahara by Nicolas Bodington. (Andre Deutsch, London, 1961). 175 pages. Price 18sh.

The North African campaign of World War II brought this arid part of the world into focus for many people, and the study of this campaign has made many more familiar with this territory. Few amongst those who took part in this campaign and fewer still amongst its students would have imagined what riches this terrain, and even the more inhospitable Saharan Desert to its south would have in store only a few years later.

The success story of the Sahara is hardly five years old. The nineteen-fifties saw the commercial possibilities of the oil, and other minerals. All these might have tempted man with their profits, but it was only the availability of water, that has made the exploitation of these a practical proposition. The concept of an immense quantity of water in the desert is almost as paradoxical

as many of the other myths connected with the "ard es Sah'ra"—the procession of deserts. The author pricks the bubbles of these myths and brings to us the situation as it exists, in his interesting and topical book, "The Awakening Sahara".

"Oil has been flowing since October, 1959 at the rate, of just under 5 million tons a year, and now getting on for double through the 22 inch and 24 inch pipelines from Hassi Messaoud to Bougie, 415 miles away on the coast." Another pipeline is 490 miles long. The roads, and airstrips which have gone hand in hand with the development of the oil townships are no less fantastic for their size and location. But above all, the greatest credit must go to the men who have made these things possible. The author takes pains to explain the historical background of the Sahara. He knows his subject well, and possibly the most important point that he makes is that unless the organisation for the development of such inaccessible and inhospitable terrains is correct, its development can hardly progress—a point which we readers in India need to take note of for similar problems facing us.

It is of interest to note that the demands of the terrain have produced the equipment required to develop it. The author explains in detail the evolution of the heavy lorry required to move loads of oil drilling equipment, and which have to traverse not only regions connected by road and tracks, but the desert. These lorries must be prepared to stand up to all conditions, surfaces, and slopes up to one in three with a load of twenty-five to forty tons, and must be able to run on any fuel and keep up a regular performance without fuss. Such paragons of vehicles have been evolved, with tyres seven feet ten inches, operating with a rolling load of ninety tons and the tyre pressure down to one kilogramme per cubic centimetre so that their wheels sink only four inches into soft sand, where a man on foot would be up to his knees.

The author gives details of the evolution of the society in the newly opened up regions, and discusses the impact of this not only on the European who finds himself there but also on the social and economic structure of the indigenous people. The careful nomad of the desert, he mentions would when forced eat the skin of a date one day, the flesh the next, and on the third pound up the stone for food. Today, a man working there gets paid in accordance to the laws of the West, and with it many have exchanged their traditional "gandoura" for blue jeans and at the same time started for the first time to satisfy pangs of hunger they have never been without. And yet, these so-called improvements have led to the break up of the society as it existed, and unless it can be replaced with something which can satisfy the inherent qualities of the people, material comforts by themselves will leave the people not richer but poorer. It is of interest to note that the French Government have established organisations to see what can be done in this direction as also in the material progress of the region.

The story is told in a clear matter of fact manner. At places there seems to be an unnecessary amount of technique jargon, but that should not frighten away the serious reader. Besides the current affairs angle, this book has much to commend the Indian reader interested in the development and organisation of backward areas within our own territories, where there might be no desert as in the Sahara, but where problems similar to it exist.

A.M.S.

"Oldest Ally": "A Portrait of Salazar's Portugal" by Peter Fryer Patricia McGorsan Pinheiro. (Dennis Dobson, London, 1960). 280 pages. Price 25sh.

In the vast flood of words which have appeared recently on the subject of Goa and its subjugation by the Portuguese, we have been given little insight

into the Portuguese character and the make-up of modern Portugal. Here then is a book to take its reader not only as a tourist interested in the sights, sounds and smells of Portugal as also its cuisine, but also to feed him on statistics, produced from Portuguese and other sources as to its economic conditions together with a potted history of the Salazar regime, and the political situation as current in Portugal up to 1961, but before the expulsion of Portuguese rule over its Indian possessions, and the recent revolt in Portugal.

The authors make no secret of their sympathies which are openly anti-Salazar. They point out that Salazar's regime has remained not only because of an opposition which is disunited and ineffective, but because it has maintained itself for three decades without the flamboyance usually associated with totalitarian rule, but with stubborn and narrow conservatism. It would appear as if the regime believed that if the twentieth century was thoroughly ignored, it would go away. The authors write pointedly exposing one myth after the other which Salazar's Government has used for keeping up British good will. When the facade is removed, Portugal shows up in its true colours as an "underdeveloped European country". Its social customs too, would appear to be those which one might expect in an underdeveloped country. Its middle class household still revolves around domestic servants. The men are not only free for domestic drudgeries—a rare event in modern Europe, but are very much lords and masters to their womenfolk. The church still plays an important part but is hardly a mere adjunct of the State.

The authors, one of whom is half-Portuguese, take great pains to put over their views fairly and critically. The portrait they paint is a comprehensive one, showing not only the charm and beauty of the country, but the quality of its people who have tolerated so much with fortitude and patience.

This book is a useful addition to any library and readers who wish to have a concise background information on modern Portugal.

A.M.S.

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Correspondence is invited on subjects which have been dealt in the Journal, or which are of general interest to the Services

To the Editor of the USI Journal

INTEGRATION OF ANTI-AIRCRAFT ARTILLERY WITH THE AIR FORCE

Sir,

I have read Major M. L. Kataria's article pleading for the integration of anti-aircraft (AA) artillery with the air force, published in the April-June 1961 issue of the Journal. The arguments he has put forward in support of this plea do not carry enough weightage as the convince others and convert them in favour of the proposed integration. Let us examine this case.

It is agreed that air defence is a combined operation—of air force and AA element of the army—with AA being the junior partner and subject to the "overriding control of the air force". Similarly, air-borne operations are carried out jointly by the army and the air force. This does not mean the aircraft required for such operations should be integrated with the army; or does it? Take the case of Tactical Air Support which is mainly for the benefit of the army. Does it mean we should also have the aircraft performing this task as an integral part of the army? More so in view of the long procedure involved in obtaining such support?

What is the role of AA artillery? It is to provide the artillery component of the air defence; and "the primary aim of air defence forces is to forward the *Army Plans* and to prevent the enemy air force from interfering with their execution. Some typical tasks for the AA artillery are given in the succeeding paragraphs.

EXAMPLES OF AA TASKS

Some typical tasks of AA artillery in the combat zone are as follows:

- (a) *Light AA Units of Divisions*.—Protection of gun areas, defiles, assembly areas, columns on the move, divisional headquarters and installations, air observation post landing strips.
- (b) *Light AA Units of AGs Artillery (AA)*.—Guarding of airfields, AG artillery gun areas, corps headquarters, progressive relief of divisional LAA units on tasks requiring continued protection.
- (c) *Light AA/Searchlight Units*.—Protection of airfields and important vulnerable points liable to be attacked by night.
- (d) *Heavy AA Units*.—Protection of communication centres, airfields, gun areas, formation assembly areas, defiles of prime importance, formation main installations.

AA artillery performs important tasks also in the communication zone, such as the protection of ports, factories, airfields, base installations, railway marshalling yards and so on.

From the above it will be seen that the army is the one which benefits the most from these uses of AA artillery. Then why tear this component away from it? And why instead of leaving it (the army) to remain self-suffi-

cient, make it dependent upon another service and thus get involved in so much of "red tapeism" and long procedures which are already in vogue for obtaining other type of air support from the air force for which the army is dependent on the former?

We should not forget its secondary role which has been so lightly treated by him. Light AA artillery has been used in the ground role for both direct and indirect fire, e.g., harassing fire; participating in the light weight bombardment; to indicate axis of advance in night operations; to mark minefields; direct fire against lightly armoured vehicles; in incendiary role. Similarly, heavy AA artillery has been used in various ground roles, especially against tanks; it has as well been used in a seaward role against enemy sea-craft.

Major Kataria has exempted light AA artillery element from its integration with the air force. Does it not mean splitting up our AA artillery resources, which are already so meagre, and that the split will involve many administrative and training problems? Wouldn't the integrated AA artillery component of the air force require establishing a new training school, and other establishments to enable it to function efficiently, which will involve lot of drain on our finances? Therefore, one fails to visualise how this change will be economical in manpower or equipment. The suggested integration will be nothing else but duplication. We should avoid it.

As regards affiliation, it will become more complicated. As regards co-ordination, it will still have to be carried out at high levels. The "red tapeism" and "interservice formalities" will increase which might prove derogatory to the efficient functioning of this arm.

Major Kataria has taken the refuge under "current trends". From this I can visualise his taking refuge under a similar case put up by the Royal Air Force. Here, I may point out that the Royal Air Force's case to take over AA artillery for the defence of the United Kingdom, is nothing else, as has been rightly pointed out by an officer of the British Army, "but to protect the redundant personnel from a reduced fighter or bomber command, i.e., it will have found 'jobs for the boys'." But we must not forget that the army in the past has always specialised in and possessed AA units for this task. We should not blindly follow what other nations do. We should not carry out changes merely for the sake of change. Any change visualised should be indicated by the changed circumstances, if any, and the benefits to be accrued from this. In the Indian Army no peculiar circumstances have occurred to demand this change, nor one sees any benefits as its outcome. Therefore, why go for it?

I do not see any advantages in the wake of this integration, hence, it should not be effected.

On the other hand, I would suggest we form a corps of AA artillery. This could either be a separate corps, or form a separate part of the Regiment of Artillery. In the latter case the present practice of changing over officers from the AA to the other branches of artillery and vice versa should be stopped as it breaks the continuity and is not conducive to the efficient functioning of this arm.

17 SIKH

Yours faithfully,

C/o. 56 APO.

MAJOR GULCHARAN SINGH

SECRETARY'S NOTES

ANNUAL SUBSCRIPTION

Many members have not yet paid the 1961 subscription, which became due on January 1. If you have not paid yours, would you please do so without delay and so save the Institution the cost of sending further reminders.

ADDRESSES

The difficulties of tracing addresses are now increasing. Members are earnestly requested to keep the Secretary informed of changes in their addresses or if possible give a permanent address which will always find them, e.g., a Bank.

LIBRARY BOOKS

There are many instances where members keep books for 4 or 5 months in spite of reminders. It would help the Librarian considerably if members ensure the return of books to the Library within two months of their receipt or immediately on their recall.

NEW MEMBERS

From October 1 to December 31, 1961 the following members joined the Institution:

BHAGWAT, Sub-Lieut. V., Indian Navy.
 BHATNAGAR, Captain B. K., A.O.C.
 DEB, Major P. B., A.O.C.
 GHATAK, Major S. M., Engineers.
 KAPOOR, 2nd/Lieut. S. B., E.M.E.
 NEGI, Captain U. S., Artillery.
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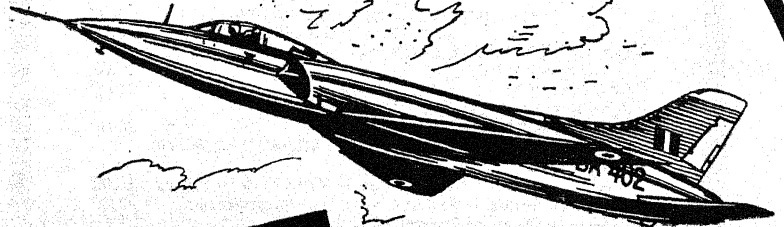
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